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External and internal factors shaping the Japan Maritime Self-Defense Force (JMSDF)

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External and Internal Factors Shaping
the Japan Maritime Self-Defense Force
(JMSDF)

by

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It is concluded that the future direction of the JMSDF will be that of keeping an effective complementary relationship with tha of the U.S. Navy.

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ABSTRACT

This thesis examines factors shaping the Japan Maritime Self-Defense Force (JMSDF). It focuses on issues concerning Japan's financial resources to improve the JMSDF in the future and the level of complementarity between the JMSDF and the U.S. Navy.

The examination reveals that there is a high level of complementarity overall between the JMSDF and the U.S. Pacific Fleet. This relationship is most likely going to continue into the future. The JMSDF most likely will not have the financial resources it will need to enhance its inventory much beyond its current force level because of the mounting pressure of other domestic budgetary needs and a lower expected Gross National Product (GNP) rate of growth.

It is concluded that the future direction of the JMSDF will be that of keeping an effective complementary relationship with that of the U.S. Navy.

TABLE OF CONTENTS

I. INTRODUCTION

A. BACKGROUND

The end of the Cold-War has influenced Japanese and United States (U.S.) defense forces in many respects. Plans for the reduction of the U.S. military have started to take shape. The U.S. Department of Defense publication, "A Strategic Framework for the Asian Pacific Rim: Looking toward the 21st Century," outlines the rearrangement of U.S. military forces. These changes, in turn, are expected to influence the future role of Pacific Rim allies, in particular, the Japan Maritime Self-Defense Force (JMSDF).

B. PURPOSE

The purpose of this thesis is to analyze "external and internal factors shaping the JMSDF."

The primary research questions are: "Does JMSDF have the financial resources to improve its forces in the future?" And "What has been and will be the level of complementarity between the JMSDF and the U.S. Navy?"

C. FRAMEWORK OF THE RESEARCH

1. Outline

There are four parts to this thesis. The first part provides background information and an introduction to this research. The second part examines and analyzes the JMSDF's financial resources for improving its forces. The third part examines and analyzes the level of complementarity between the JMSDF and the U.S. Navy. The final part presents findings and conclusions.

2. Methodology

Data on Japan's national budget, the JMSDF budget, the procurement prices of ships and aircraft, and other information was collected from the Japan Maritime Staff Office in Tokyo. This data was mainly used to conduct analysis as described in the second part of this thesis. Jane's Fighting Ships and Aircraft, 1992-93, data and data from "The Military Balance 1992-1993" (The International Institute for Strategic Studies) were used to conduct a simple statistical comparison in the third part.

3. Scope

Internal factors refer to Japanese domestic matters and external factors refer to matters outside of Japan. In this thesis I examined budgetary matters as one of the internal factors and the relationship between the JMSDF and the U.S. Navy as one of the external factors, because I judged that these factors were the most fundamental factors shaping the JMSDF. Therefore I didn't deal with other internal factors such as Japan's Consitution or other external factors such as Japan's relations with East Asian countries.

II. RESOURCES FOR JMSDF IMPROVEMENT

A. OUTLINE OF JAPAN'S DEFENSE PROGRAM

The defense policy Japan pursues under its constitution is based on the "Basic Policy for National Defense" (see Appendix A) adopted by the National Defense Council and approved by the Cabinet in May 1957. Since 1957, defense buildup plans were put into effect based on this basic policy. Table 1 shows a history and outline of Japan's Defense Program.

At first in order to implement its basic policy, Japan put four Defense Buildup Plans into effect. These plans all stressed the importance of improving the fighting capabilities of the Japan Self-Defense Forces (JSDF) and preparing the military for potential crises (see Appendix B).

With the completion of the Fourth Defense Buildup Plan in FY 1976, the "National Defense Program Outline (NDPO)" was adopted by the National Defense Council and approved by the Cabinet in October 1976.

"The NDPO is based on the concept of basic defense capability. The basic defense capability is aimed at enabling the country to be fully on the alert in peacetime and to effectively counter any limited and small-scale act of aggression."[1]

"Since the NDPO was adopted by the Cabinet, the Government has ceased to formulate defense buildup plans covering a fixed period of time as it did before. Instead, it was decided to adopt mainly the so-called 'single fiscal-year

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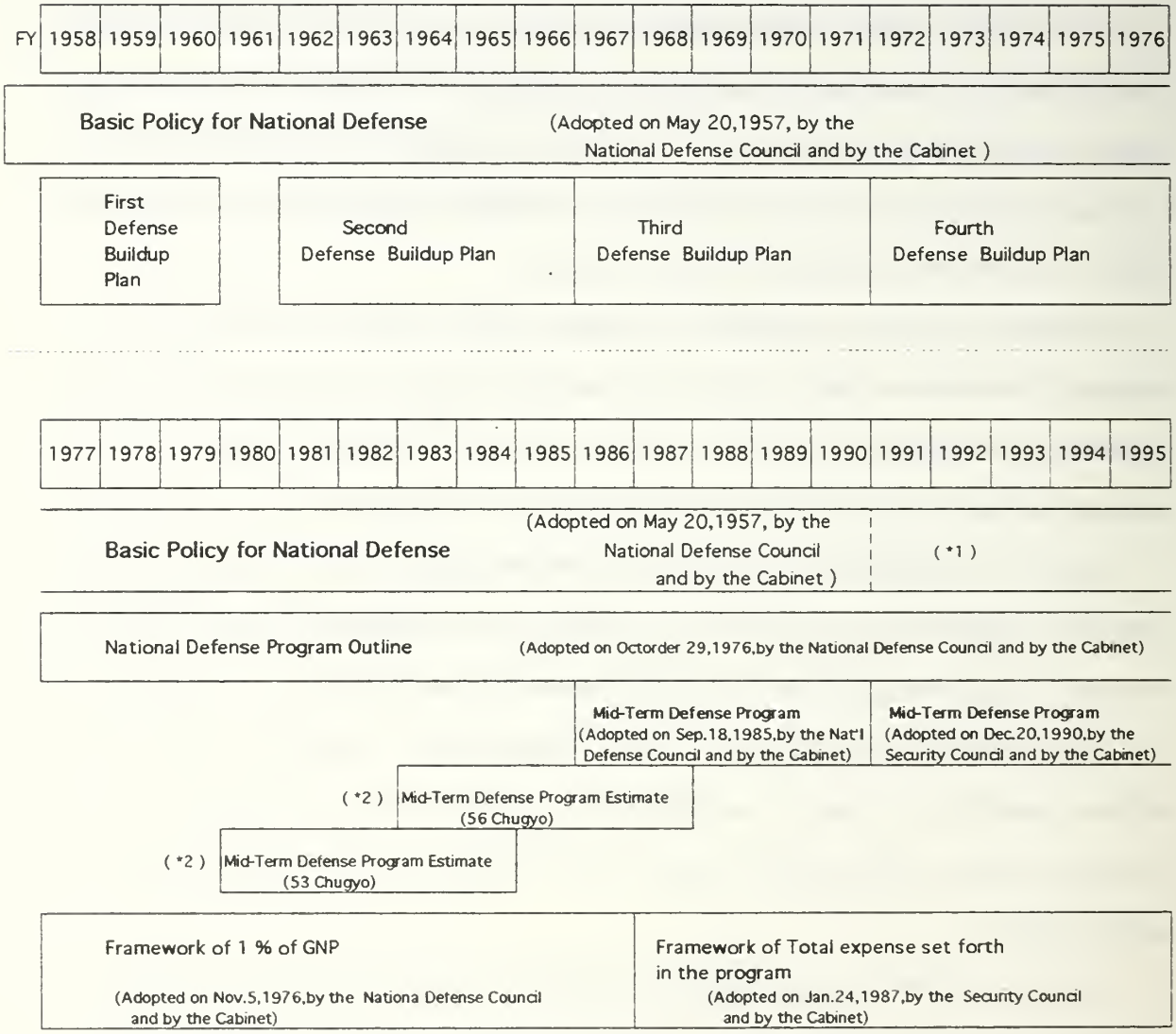
[1]Defense of Japan 1991 (Japan Defense Agency) p80

TABLE 1
Outline of Japan's Defense Buildup



(*1) : Basic Policy on Defense Planning in and after FY1991 (Adopted on Dec.19 1990, by the Security Council and by the Cabinet)

(*2) : "Mid-Term Defense Program Estimate" is an intra-department document of the Defense Agency formulated for the purpose of serving as a reference when the Agency draws up its annual defense plan.

Note : See Appendix B for brief description of buildup plans

Source: Zusetsu Nihon No Zaisei (Toyokeizai Shinposha) P197

formula' by which a necessary decision is made annually."[2] Unlike a series of previous Defense Buildup Plans, the estimated total expenditures required to implement the programs were not specified. "There was also a need to reflect a public mood for tighter restrictions on a defense budget that had increased 17.7% in 1970 to 21% in 1975."[3] On October 5, 1976, the government decided on a "Defense Buildup for the Time Being," in which placing a ceiling on defense expenditures of 1% of GNP (the so-called framework of 1 percent of GNP) was instituted.

In September 1985, the government formulated the Mid-Term Defense Program to be implemented during the period from FY1986 through FY1990. This was elevated to the status of government plan by subjecting mid-term estimates by the Defense Agency to National Security Council debates for the purpose of ensuring tighter civilian control.

In the process of the compilation of the FY1987 budget, it became certain that defense expenditures exceeded 1% of GNP. Through heated discussions among political parties, the Cabinet finally decided to discard the framework of 1 percent of GNP. Due to a need for a new limit instead of the framework of 1 percent of GNP, in January 1987, the "Defense Buildup for the Future" plan was adopted by the Security Council and approved by the Cabinet (see Appendix C).

With the completion of the Mid-Term Defense Program in FY 1990, the "Basic Policy on Defense Planning in and after FY1991" was adopted by the National Defense Council and approved by the Cabinet on December 19, 1990. This Policy stated that "The decision was based on the judgment that a trend

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[2]Defense of Japan 1982 (Japan Defense Agency) p110

[3]Managing Defense: Japan's Dilemma (Harrison M. Holland) p49

toward the stability of international relations, on the premise of which the NDPO was formulated, is currently emerging in a more advanced form--and that it is appropriate to continue efforts for defense buildup in line with the basic concept of the NDPO."[4] In accordance with this judgment, on December 20, 1990, the government formulated the Mid-Term Defense Program to be implemented during the period from FY1991 through FY1995.

B. JAPAN'S DEFENSE EXPENDITURES

1. Trends in Defense Expenditures

From Figure 1, the ratio of the Defense Expenditures to GNP has been under 1 percent of GNP since FY1967 except in FY1987 through FY1989. The ratios in FY1987 through FY1989 were 1.004, 1.013, and 1.006 percent of GNP respectively (see Appendix D). Defense expenditures to GNP increased during the 1980's and decreased since FY1990.

With respect to the ratio of defense expenditures to national budget, the ratio decreased from a high of 11.32% in FY1958 to 5.13% in FY1981, from FY1981 to FY1988 the ratio increased to 6.53% then turned down again till FY1991 settling at 6.3% in FY1992.

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[4]Defense of Japan 1991 (Japan Defense Agency) p95

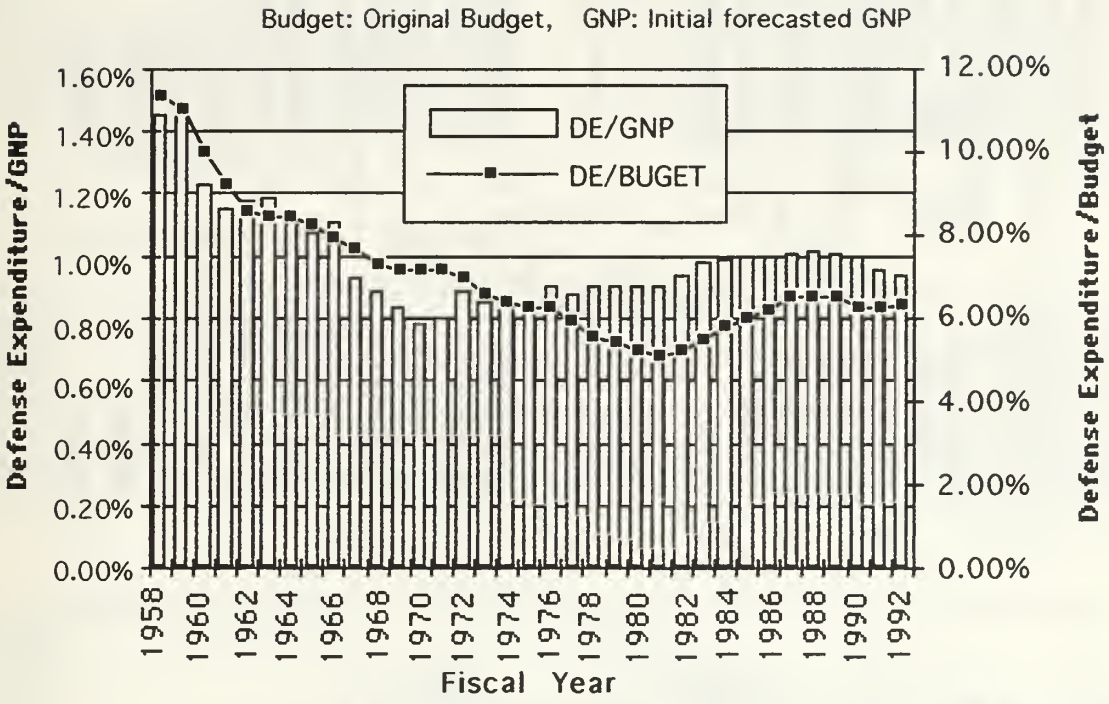
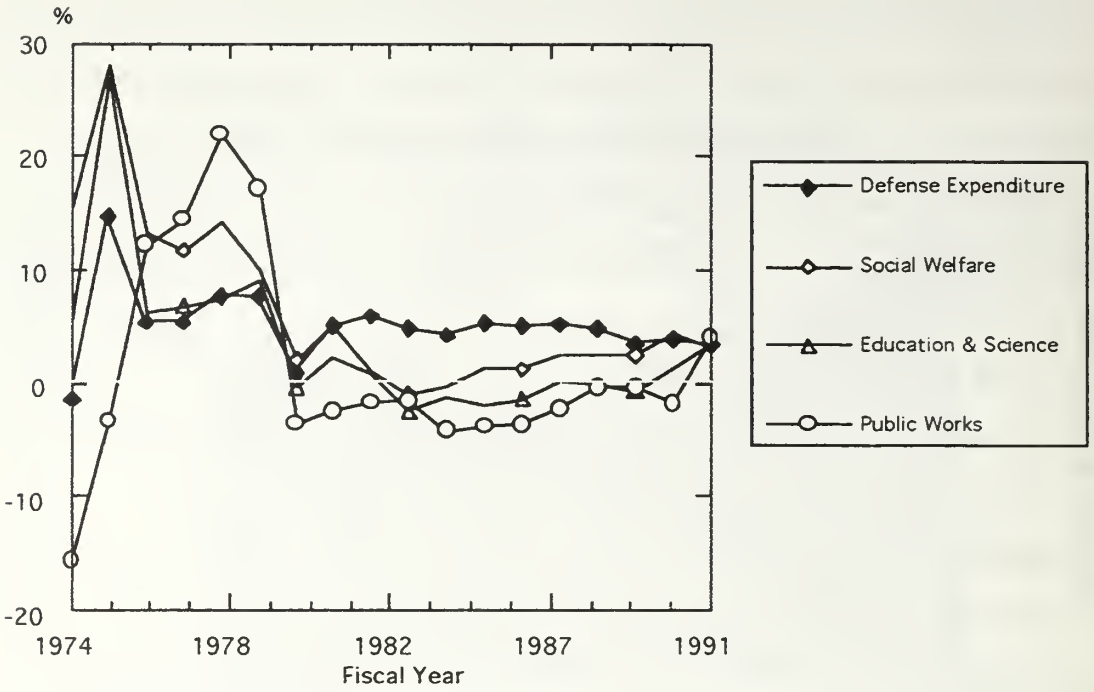


Figure 1
Trend in Japan's Defense Expenditure(DE)/GNP & DE/Budget

In comparison to the growth rate from previous fiscal years of other major budget items (Social Welfare, Education and Science, and Public Works), the growth rate of the defense expenditure for the first time exceeded those of other major budget items. This continued till FY1989 (see Figure 2 and Appendix E). From FY1982 through FY1988 the growth rate of the defense expenditures exceeded the entire budget. We can see here a clear shift of priority toward defense during the 1980's.



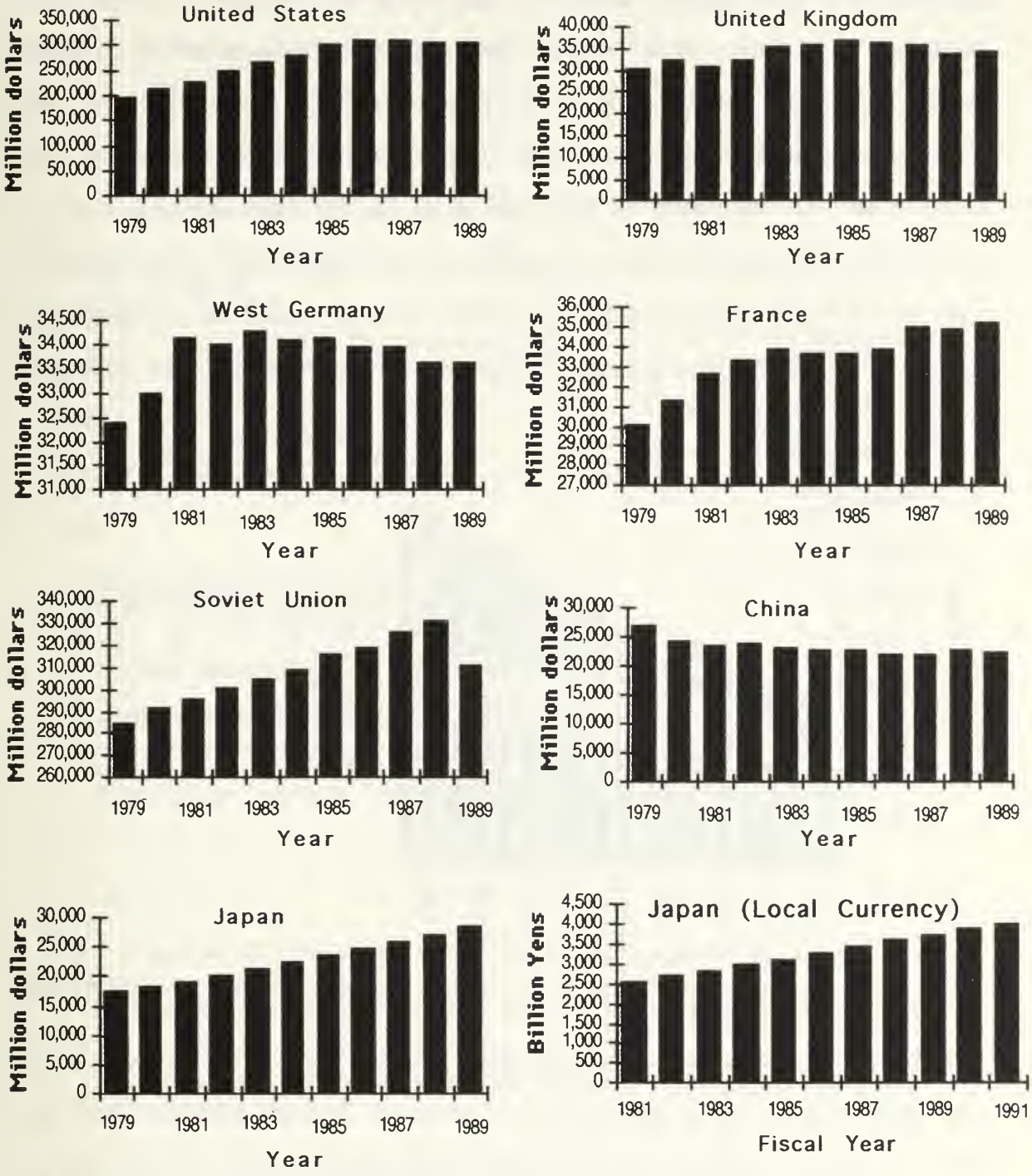
Note: This chart is expressed in real Yens, based on FY1985 prices and a FY1985 deflator.

Figure 2
Growth Rate in Major Account Expenditures

In comparison to the defense expenditures of other countries, Japan's defense expenditures have been increasing steadily year by year (see Figure 3). United States' defense expenditures declined slightly year by year since 1987. Soviet Union's defense expenditures declined substantially in 1989 and China's defense expenditures have been constant or slightly declining during the 1980's.

2. Trends in Defense Expenditures Classified by Expenses

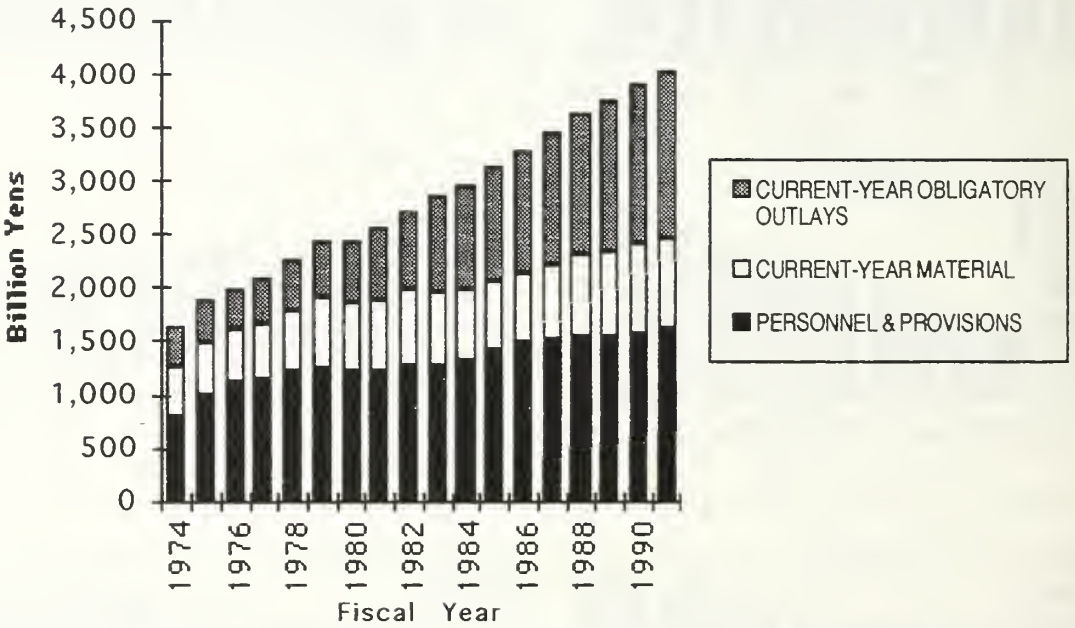
Figure 4 shows the trend in Japan's Defense Expenditures classified by expenses (personnel and provisions, current-year obligatory outlay, and current-year materials). Personnel and provisions expenses are outlays for



Note: These charts are expressed in U.S. dollars, based on 1989 prices and using a 1989 deflator. Japan's defense expenditures (local currency) are expressed in Yens, based on FY1985 prices and using a FY1985 deflator.
Source: World Military Expenditures and Arms Transfers 1990 (U.S. Arms Control and Disarmament Agency)

Figure 3
Defense Expenditures

pay and meals for JSDF personnel. Current-year obligatory outlays are expenses of contract authorization and expenses for continued projects already approved by the Diet by the preceding fiscal year. Current-year materials expenses are payable in the current fiscal year for the repair and improvement of equipment, for purchase of oil, for the education and training of JSDF personnel and for the procurement of new equipment. From Figure 4 one can see that the growth rate from previous years of current-year obligatory expenses were higher than those of other expenses (see Appendix F).



Note: This chart is expressed in real Yens, based on FY1985 prices and a FY1985 deflator.

Figure 4
Trends in Japan's defense Expenditures (by Expenses)

Figure 5 shows the share trend in Defense Expenditures classified by expenses. From this figure one can see that the share of current-year obligatory outlays has been increasing year by year since FY1979. On the

other hand, the shares of personnel and provisions expenses and current-year materials expenses have been decreasing.

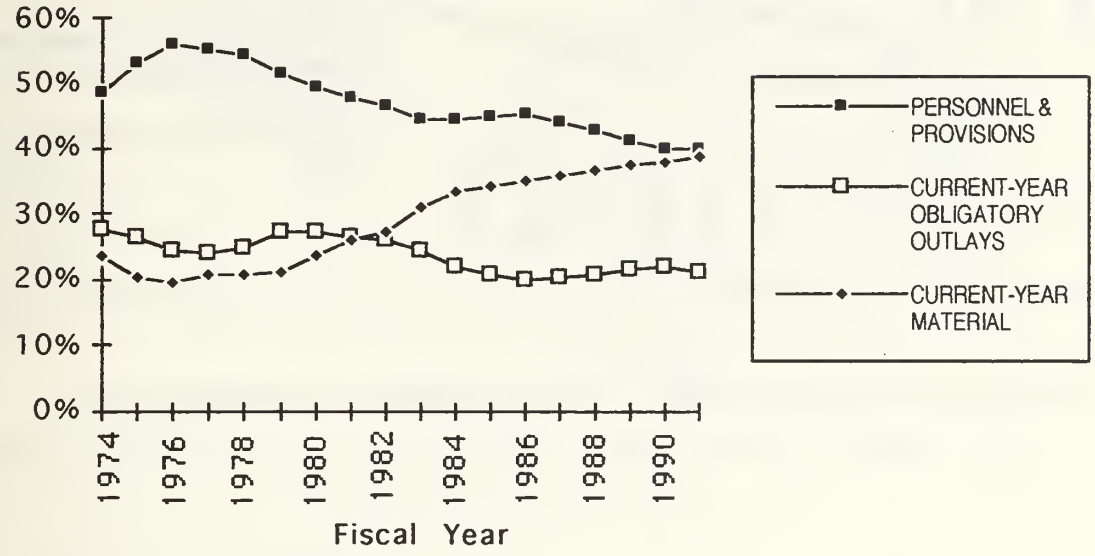
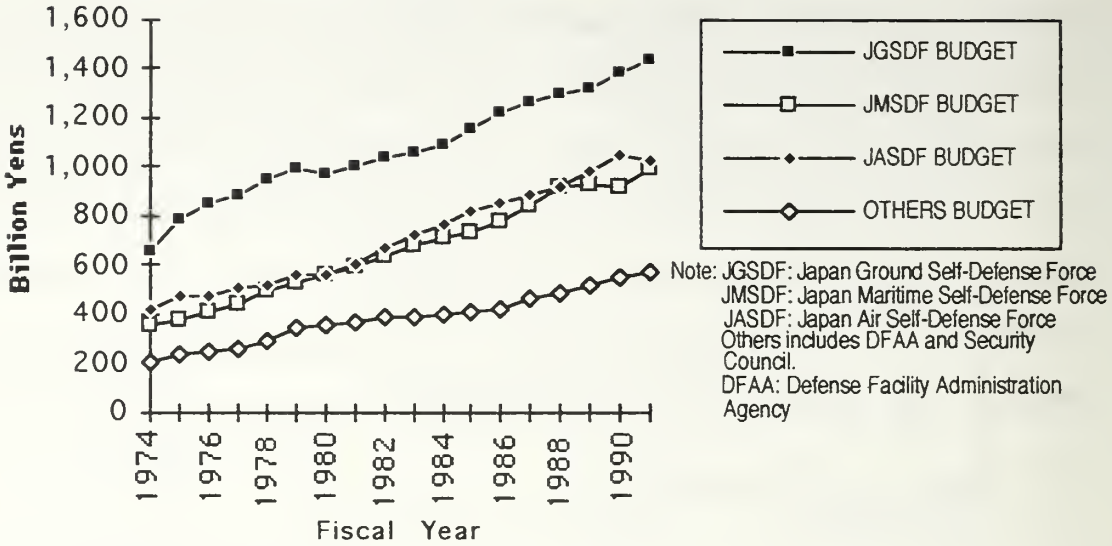


Figure 5
Trends in Japan's Defense Expenditures (By Expenses)

3. Trends in Defense Expenditures classified by Organization

Figure 6 shows the trends of the Service budgets since FY1974 and Figure 7 shows their share trends. Figure 6 shows steady budget growth for each Service. From Figure 7, in recent years the budget share of the JGSDF has been about 35% of the entire Defense Expenditure. It has decreased by 5% from what it was in FY1980. About 25% of Defense Expenditures is the JMSDF budget and that is almost the same as the JASDF budget (see Appendix G).



Note: This chart is expressed in Yens, based on FY1985 prices and using a FY1985 deflator.

Figure 6
Trends in Japan's Defense Expenditures (by Organization)

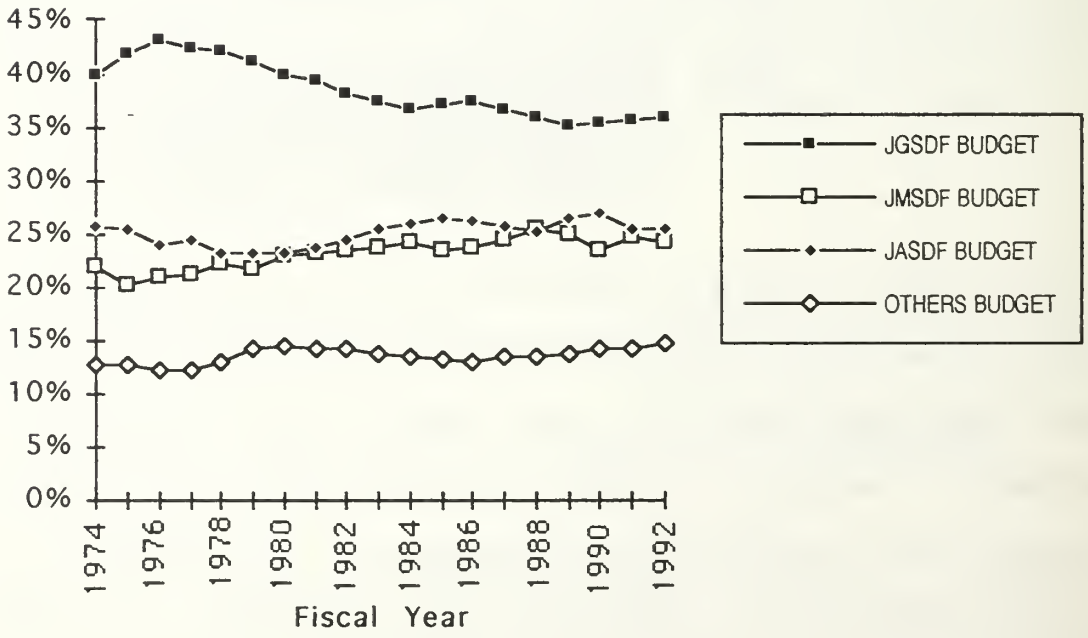


Figure 7
Share Trends in Japan's Defense Expenditures
(by Organization)

When we look into the ratio of each Service's budget to GNP, we can see the difference between data before FY1981 and data after FY1982. Table 2 shows the average ratio of each Service budget to GNP (also see Appendix H).

TABLE 2 Ratio of Each Service Budget to GNP

	Average Ratio (FY1974-FY1981)	Average Ratio (FY1982-FY1991)	Change
JGSDF	0.36%	0.36%	0%
JMSDF	0.19%	0.24%	0.05%
JASDF	0.21%	0.25%	0.04%

The increase of Japan's Defense Expenditures compared to GNP during the 1980's was caused by increases in the JMSDF and JASDF budgets.

4. JMSDF Budget

As stated above, the JMSDF budget is approximately 25 percent of the entire defense budget. Figure 8 shows the share trend in the JMSDF budget classified by expenses (personnel and provisions, current-year obligatory outlays, and current-year materials) (see Appendix I). Figure 9 shows the share trend in the JMSDF budget classified by three components, that is, personnel and provisions, front-line, and others. Front-line expenses are outlays for the procurement of ships and aircraft, etc. From Figures 8 and 10, since the late 1970's current-year obligatory outlay expenses and front-line expenses are larger compared to other expenses of the JMSDF budget. The priority of the JMSDF budget was set for shipbuilding expenses and aircraft procurement expenses (see Figure 10 and Appendix J).

We will find this change more clearly, when we look into the modernization of ships and aircraft later.

Another significant change is that the JMSDF budget was allocated most to personnel and provisions expenses during FY1974 through FY1979. It was caused by the cost increase driven by the so-called oil crisis. The inflation driven by the effect of the so-called oil crisis impacted substantially on the materials costs for shipbuilding also. As a result of the increased materials prices, shipbuilding could not be performed smoothly in accordance with the original program.

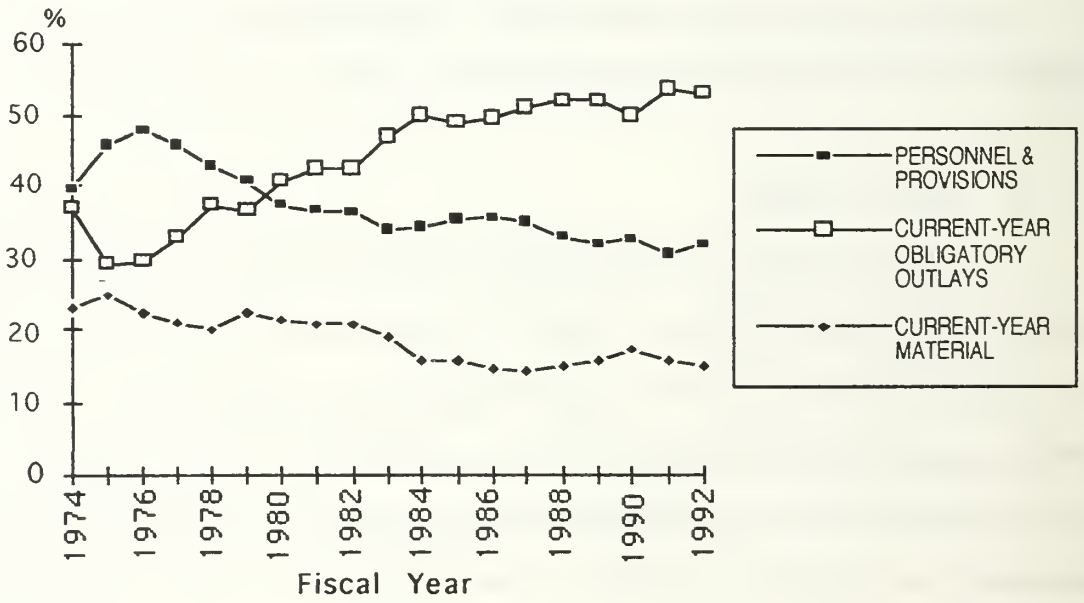


Figure 8
Share trends in JMSDF Budget (by Expenses)

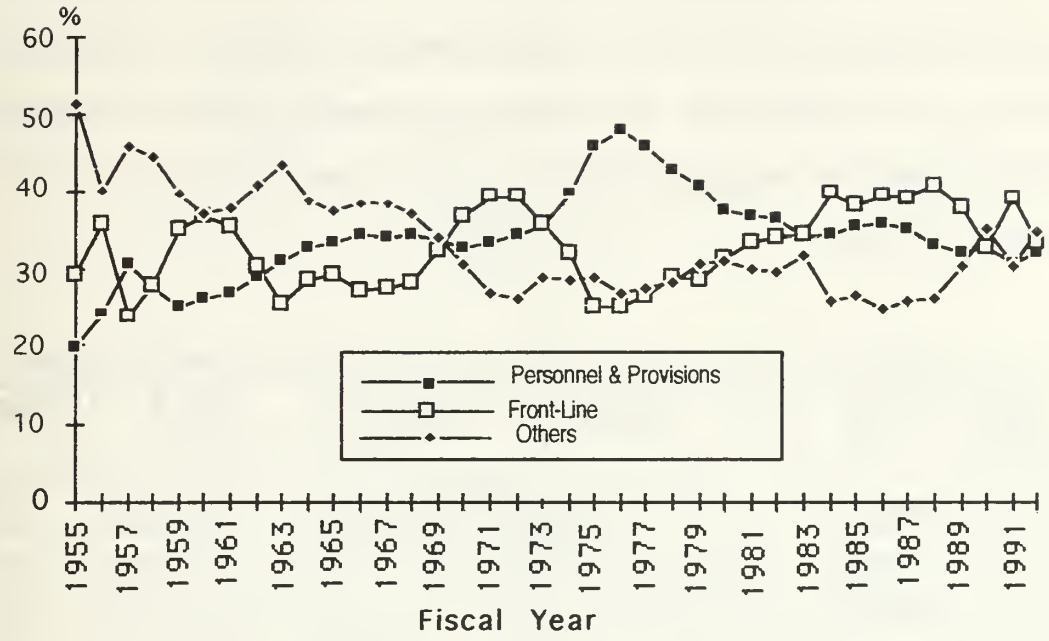
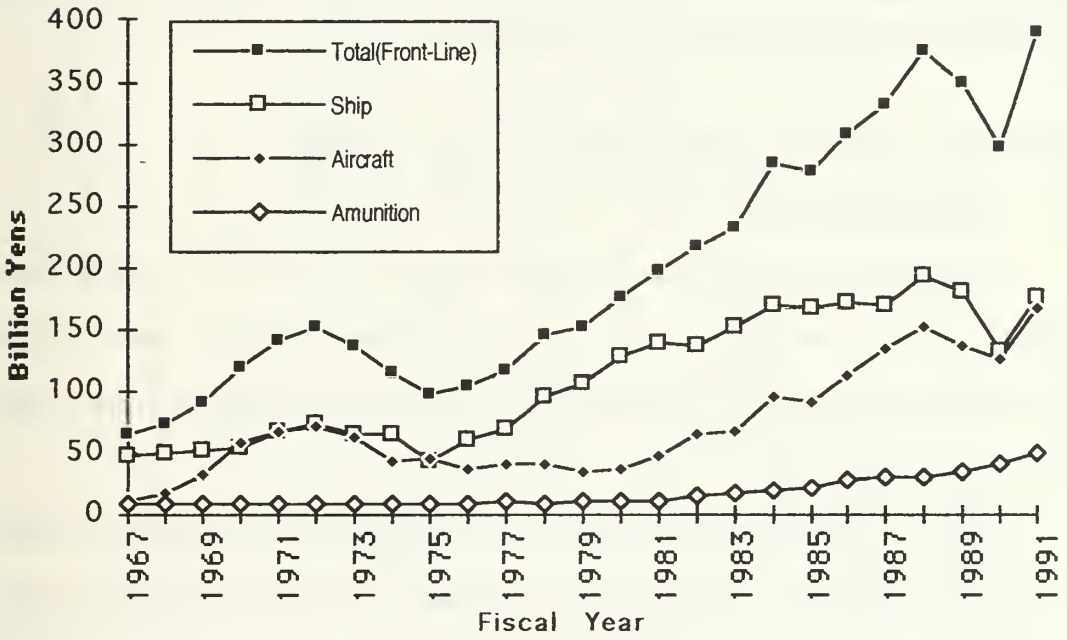


Figure 9
Share Trends in JMSDF Budget (by 3 Components)



Note: This chart is expressed in real Yens, based on FY1985 prices and a FY1985 deflator.

Figure 10
Trends in JMSDF Front-Line Expenses

Table 3 clearly shows the effect of the oil crisis driven inflation on the cost of shipbuilding. The cost of ships scheduled in FY1973 increased by 30%-60% from the original cost. These additional expenses were paid from the construction fund that was supposed to have been spent for a DE and a SS scheduled for FY1974.

TABLE 3 Oil Crisis Effect on the Shipbuilding Program

Fiscal Year	Ship type	Ship Name	Ton	Original Cost (1,000Yen)	Revised Cost (1,000Yen)	Change Cost (1,000Yen)	Change (%)
1973	DDG	ASAKAZE	3,850	22,968,064	30,136,794	7,168,730	31.2
	DE	NOSHIRO	1,500	5,101,807	8,131,297	3,029,490	59.4
	SS	YAESHIO	1,850	9,808,169	15,232,172	5,424,003	55.3
1974	DD	YUGUMO	2,150	11,610,697	12,987,931	1,377,234	11.9
	DE			6,117,329	0	-6,117,329	-100.0
	SS			11,037,005	0	-11,037,005	-100.0

Source: Kaijojieitai Yoyan Jimuteiyo (Kaijobakuryokanbu)

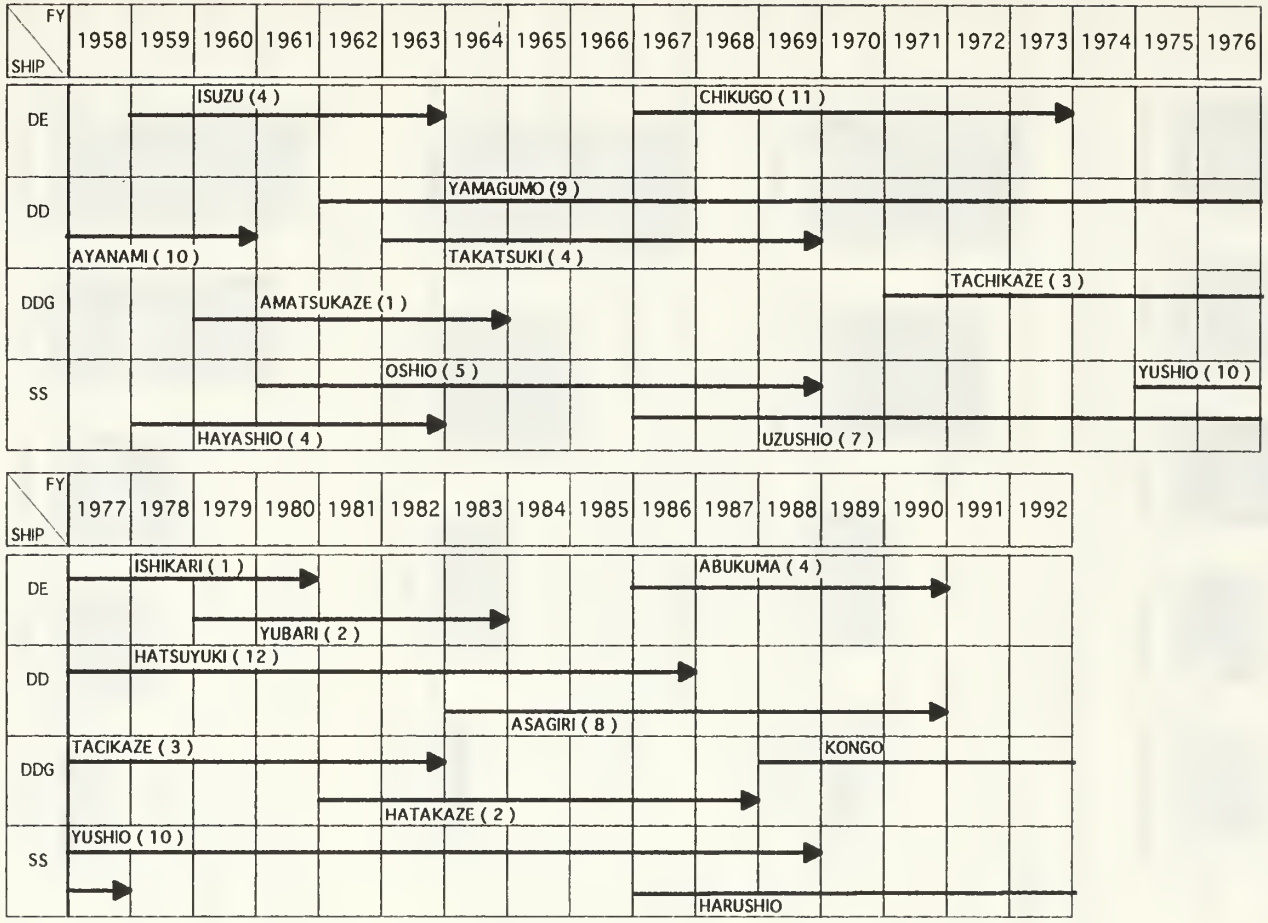
C. SHIP AND AIRCRAFT EXPANSION IN THE JMSDF

1. Ship Expansion

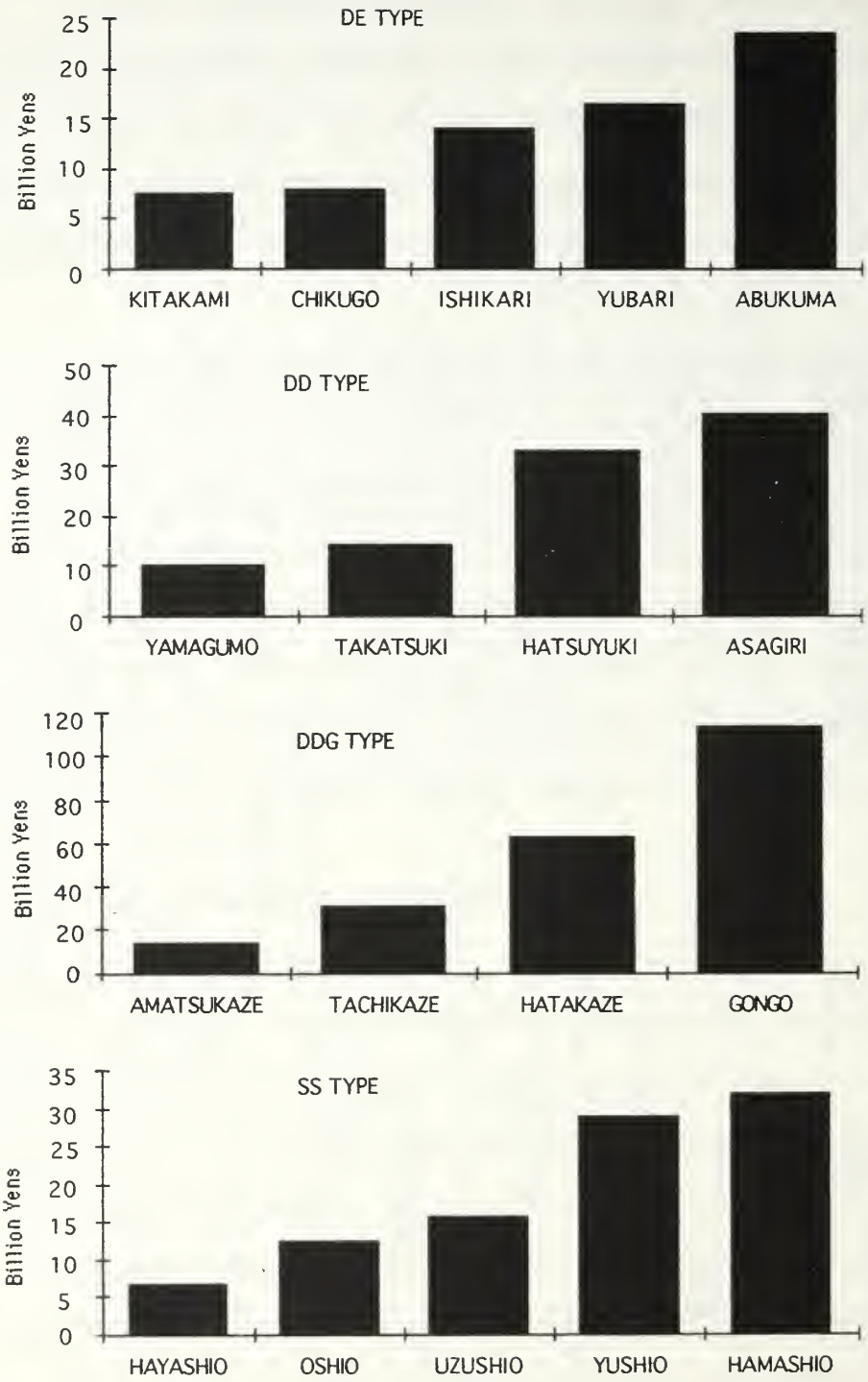
From observing ship construction over 30 years in the JMSDF, new ship types have been created every 7 to 10 years on average (see Table 4). The ship expansion pace has been substantially fast. Needless to say, new ship types bring increased costs.

Figure 11 shows trends in shipbuilding costs for the different types of ships (Escort Vessel : DE, Destroyer : DD, Guided Missile Destroyer : DDG, Submarine : SS)(see Appendices K and L). In every type the real building cost per ship increased substantially. For example, in DE the real building cost of ABUKUMA is 3.2 times as that of KITAKAMI. In the same manner, in DD, the

TABLE 4
Trends in JMSDF Ship Construction



Note : 1. Number in parenthesis is number of ships built as the same type.
2 ⟶ is a period of ship building in the same type.
Source: Kantei To Kokukisyu (Kaijojieishinbunsya)



Note: These charts are expressed in real Yens, based on FY1985 prices and a 1985 deflator.

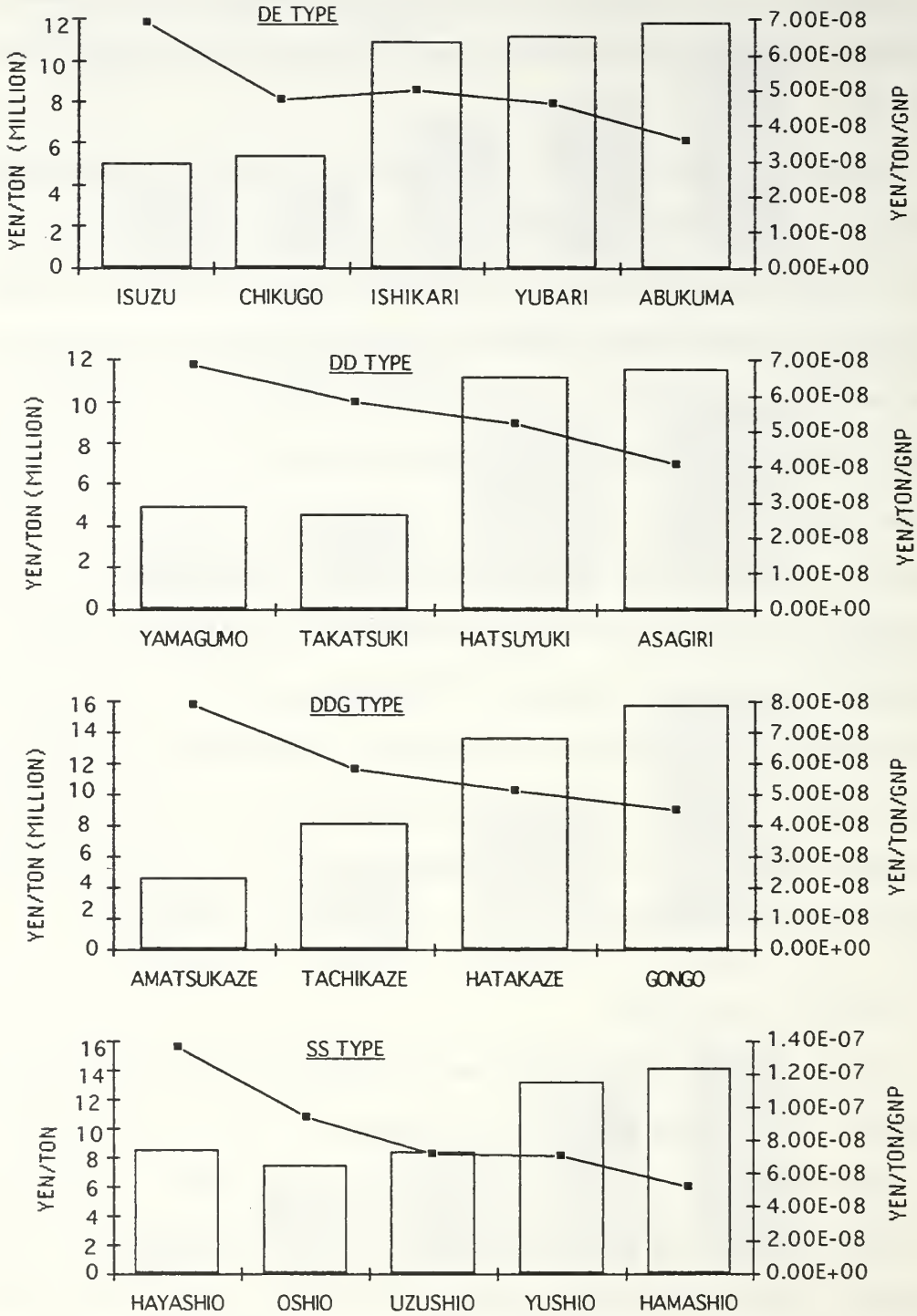
Figure 11
Trend of Shipbuilding Cost (by Ship type)

ASAGIRI's cost is 4 times of YAMAGUMO's, in DDG, the KONGO's cost is 8 times of AMATSUKAZE's, in SS, the HARUSHIO's cost is 4.8 times of HAYASHIO's (see Appendix M).

In terms of the real building cost per ship per standard displacement ton, we can see an ascendant trend like in the real building cost per ship (see Figure 12). We also notice that there is a big difference in the real building cost per ship per standard displacement ton between CHIKUGO and ISHIKARI in DE, between TAKATSUKI and HATAUKI in DD, between TACHIKAZE and HATAKAZE in DDG, and between UZUSHIO and YUSHIO in SS. This big difference means significant qualitative improvement in ship's system performance. In fact, there were introductions of computerized systems which control and access much tactical information and also gas turbines for main propulsion machinery. In addition, the JMSDF is starting to equip missile weapon systems on all new ships. This ship modernization with high technology started in the late 1970's. Ship modernization with highly efficient systems had an impact on the real ship building costs. As a result, the real ship building costs rose suddenly.

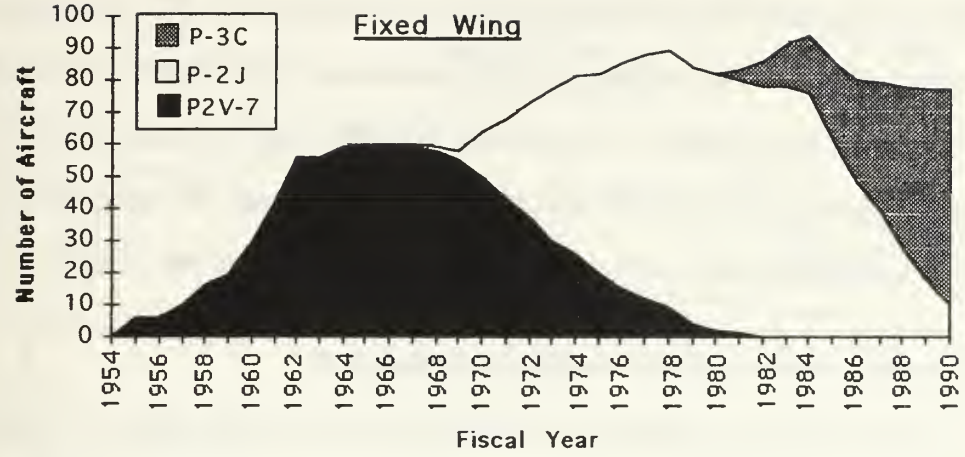
2. Aircraft Expansion

In the JMSDF almost all combat aircraft are Anti-Submarine Warfare (ASW) aircraft. From Figure 13 (also see Appendix N), we can see clearly the trend of ASW aircraft inventories over 30 years in the JMSDF. New type aircraft have been acquired about every 12 years in both fixed-wing aircraft and helicopters. There were sudden increases of the real costs between HSS-2 and HSS-2B in helicopters and between P-2J and P-3C in fixed-wing aircraft. The real cost of HSS-2B is 2.5 times as that of HSS-2 and P-3C cost is 2.3 times



Note: 1. Yen/Ton in these charts are expressed in Yens, based on FY1985 prices and using a FY1985 deflator.
2. Line graph is measured by the right-hand scale.

Figure 12
Trend of Yen/Ton and Yen/Ton/GNP



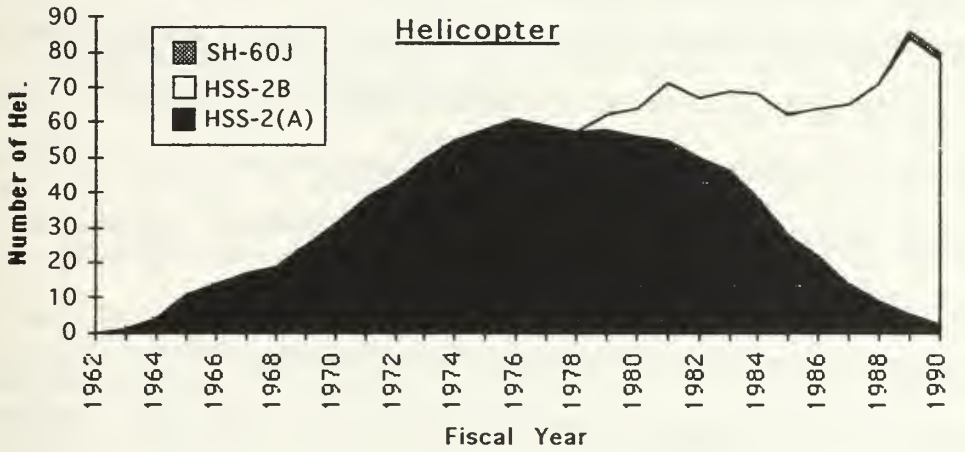
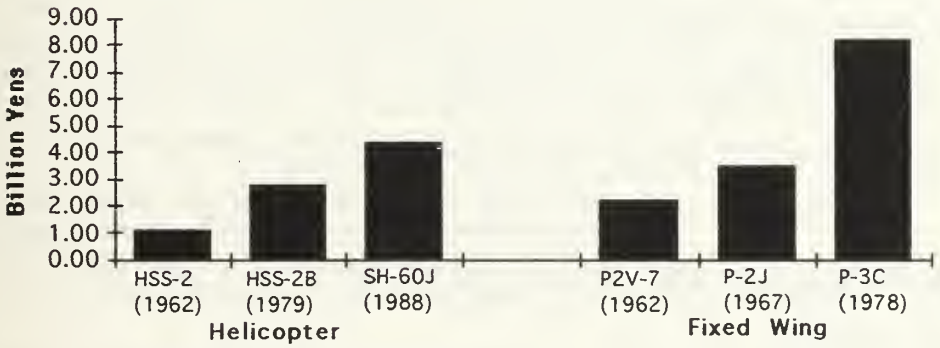


Figure 13
Trend of ASW Aircraft Inventories



Note : (Number) is the fiscal year when the aircraft was procured.
This chart is expressed in real Yens, based on FY1985 prices and a FY1985 deflator.

Figure 14
Aircraft Cost Trend (by Type)

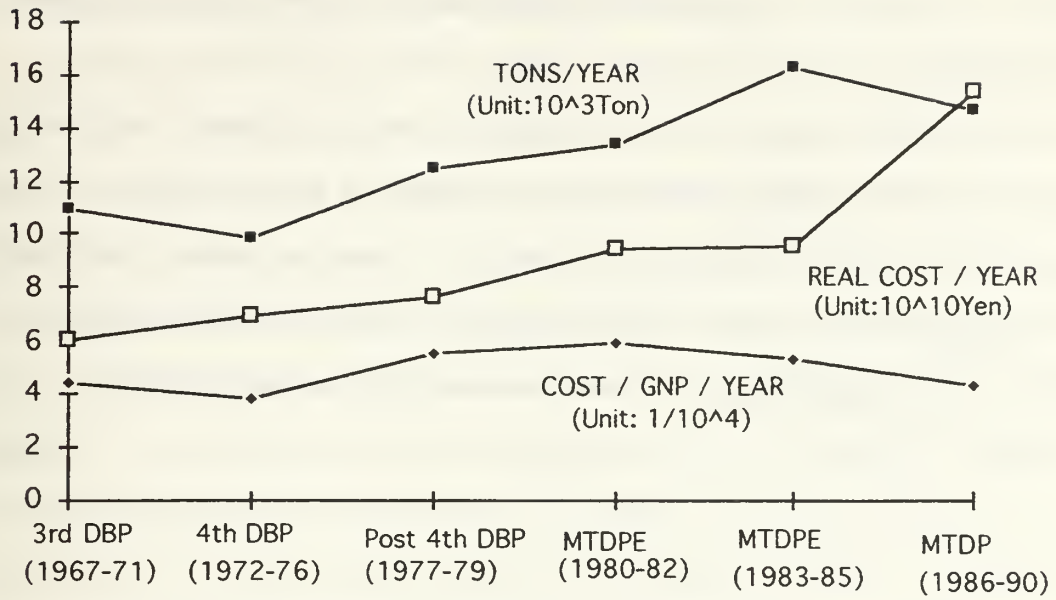
P-2J cost (see Figure 14 and Appendix O). P-3C's are equipped with computerized systems that can deal with a lot of collected tactical information in a short time. HSS-2B's are equipped with enhanced capabilities to manage information, such as the tactical data display system. This sudden rise of the real aircraft procurement cost also means an enhancement of capability and performance. Acquisitons of P-3C's and HSS-2B's began in the late 1970's.

3. Further Observations in Ship Expansion

As seen above, expansion of ships and aircraft with computer systems and enhanced capability and performance equipment has been promoted strongly since the late 1970's when the 4th Defense Buildup Plan was completed and the National Defense Program Outline was formulated. It is true that this expansion resulted in increased real procurement costs. We can, however, find different significant aspects by looking further at the expansion of ships and aircraft.

I examined the trend of the ratio of shipbuilding cost per ton to GNP shown. In DE: the ratio declines from KITAKAMI of 6.88/100million (expressed below as 6.88 instead of 6.88/100million) to ISHIKARI of 4.99 and to ABUKUMA of 3.58; in DD: from YMAGUMO of 6.87 to HATSUYUKI of 5.23 and to ASAGIRI of 4.08; in DDG: from AMATSUKAZE of 7.90 to HATAKAZE of 5.11 and to KONGO of 4.48; and in SS: NATSUSHIO of 13.7 to UZUSHIO of 7.23 and to HAMASHIO of 5.25.

Figure 15 shows the trends of displacement (Tons) built per year (Tons/Year), real building cost (FY 1985) per year (RealCost/Year), and the ratio of shipbuilding cost per year to average GNP (Cost/Year/GNP) during each defense program.



Note:DBP:Defense Buildup Plan; MTDPE: Mid-Term Defense Program Estimate;
MTDP: Mid-Term Defense Program

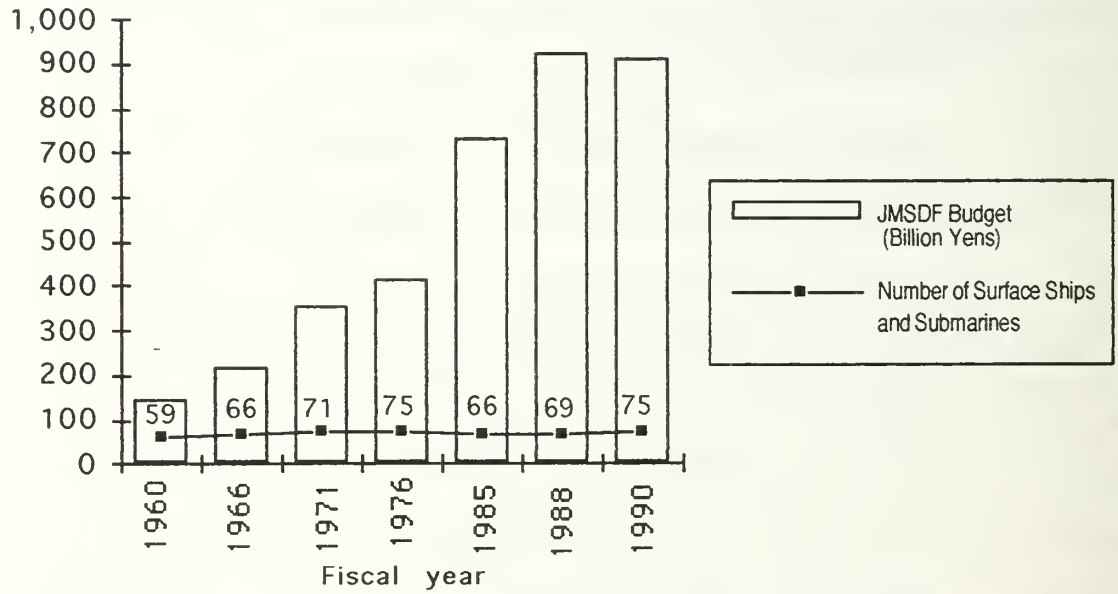
Figure 15
Trends in Shipbuilding (by 3 Indicators)

The result of a decline of the ratio of a shipbuilding cost per ton to GNP in each ship type, caused no expansion of the ratio of Cost/Year/GNP in each defense program. The ratio of Cost/Year/GNP in the 3rd Defense Buildup Plan (DBP) is almost the same as that in the Mid-Term Defense Program (MTDP). On the other hand, Tons/Year increased from 11,000 in 3rd DBP to 14,700 in MTDP and RealCost/Year also increased from 60 billion in 3rd DBP to 154 billion in MTDP. These increasing rates are 1.34 times in Tons/Year and 2.57 times in Real Cost/Year (see Appendix P). This means that the JMSDF could increase the amount of ships by almost the same cost to GNP, in spite of substantially increasing real shipbuilding costs.

In the past Japan's Defense Budget was allocated by about 1 percent of GNP and on average GNP has increased by 4.3% each year for the last 20 years (see Appendix Q). Under this situation, the JMSDF could have financial

resources to increase its number of ships and aircraft without causing financial difficulty.

As seen in Figure 16, the number of ships (Surface ships and Submarines) has remained constant at about 70 ships for the last 30 years. On the other hand the JMSDF's budget has increased. Since this means that extra money was spent on the same number of ships, displacement per ship was increased or more expensive and effective weapon systems were installed.



Note: Budget is expressed in Yen based on FY1985 prices and using a FY1985 deflator.
Source: Boei handbook (Asagumoshinbunsha)

Figure 16
JMSDF Budget and Ship Inventories

D. FINANCIAL RESOURCES TO IMPROVE JMSDF

Assuming the Defense Budget will be allocated around 1 percent of GNP and GNP will continue to increase as it has in the past, JMSDF will have a potential capability to enhance its number of ships without financial difficulty.

When we take into account domestic issues and international situations at the present and in the future, we must say the assumption above is fairly optimistic. At first the average real growth rate of the Japanese economy in the future might be lower than that of the past[5]. "The next ten years will be a critical period for Japan, which must begin considering how to provide for its aging society. If Japan does not invest in societal infrastructure during this period, when saving rates are high and its population active, it will not be able to insure that people continue to enjoy a quality of life similar to that of Europe and the United States."[6] The priority of budget allocation will tend to shift to Social Welfare and Public Works.

Figure-17 shows real shipbuilding costs (FY1985) per ton for DE, DD, and SS. We can categorize two groups by before FY1974 and after FY1975. As I stated before, DE ISHIKARI, DD HATSUYUKI, and SS USHIO are ships equipped with highly computerized equipment, missile weapon systems, and gas turbine machinery (except SS). Ships after FY1975 are, so-called, New-Type-Ships and ships before FY1974 are, so-called, Conventional-Type-Ships. From Figure 17, we can see that real costs will rise substantially when the ships equipped with

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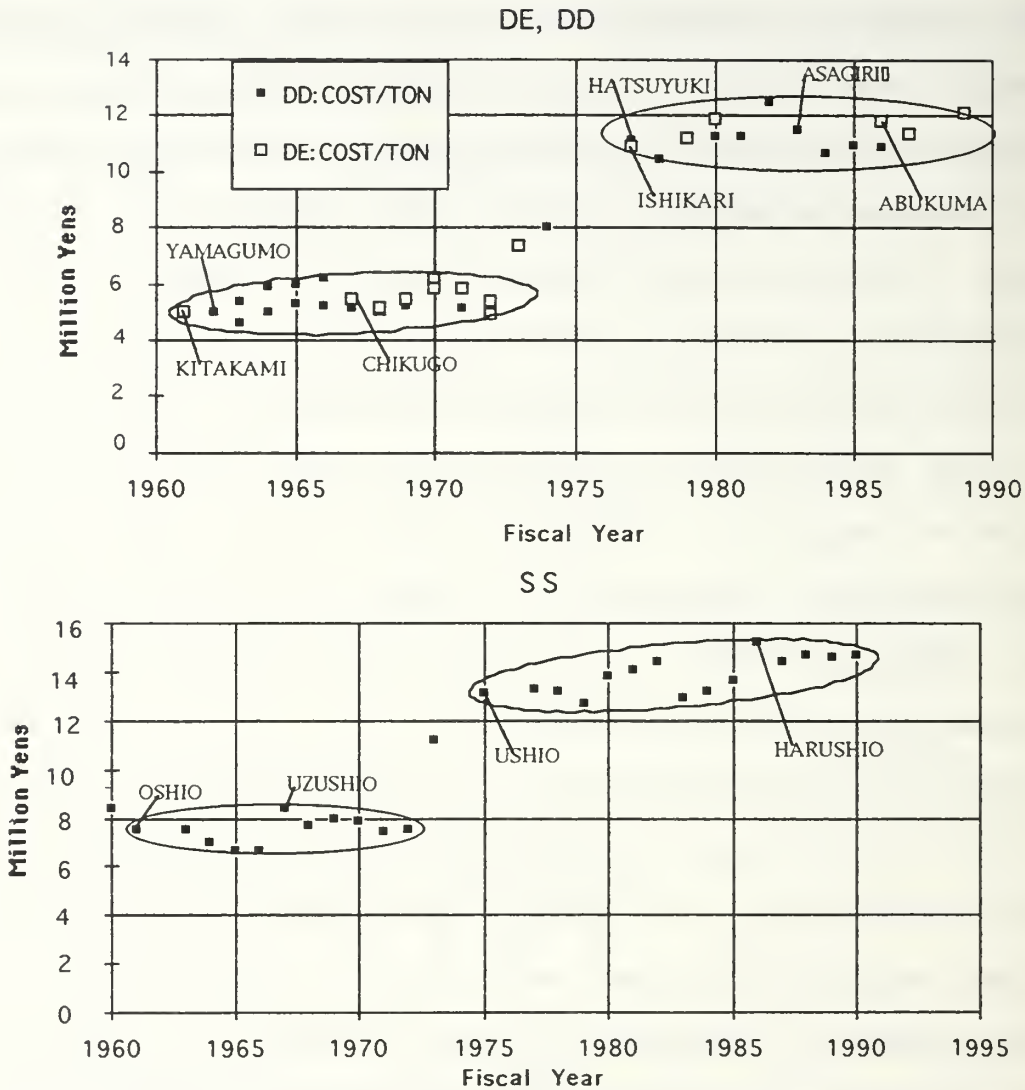
[5]The Japanese new economic plan (formulated by the Economic Deliberation Committee in January 1992) set average real growth rate target at 3.5%.

[6]Asian Security 1992-93 (Research Institute For Peace And Security, Tokyo) p129



Note : The shipbuilding costs are expressed in real Yens based on FY1985 prices and using a Fy1985 deflator

Figure 17
Trends in Shipbuilding Cost/Ton

highly advanced technological systems are constructed. In the past the JMSDF had enough financial resources to cover the increased costs introduced by advanced technological systems.

In addition the end of the Cold War will not lead Japan to enhance military forces over its current levels and will likely cause defense expenditures to be cut.

When we focus on the future of the JMSDF taking the above factors into consideration, the JMSDF is likely to have less financial resources to enhance its current force level.

III. COMPLEMENTARY RELATIONSHIP BETWEEN THE JMSDF AND THE U.S. NAVY

A. BALANCED NAVY CONCEPT

"...From the Sea", which is the U.S. Navy and Marine Corps White Paper published in September 1992 by the Department of the Navy of the U.S., stated the following about Naval Forces and Naval organizations. "As Naval Forces shift from a Cold War, open ocean, blue water naval strategy to a regional, littoral, and expeditionary focus, Naval organizations will change. Responding to crises in the future will require great flexibility and new ways to employ our forces." Naval Force Packages will consist of the following different types of ships and aircraft:

- Aircraft carriers and air wings
- Amphibious ships with embarked Marines
- Surface combatants
- Navy Special Warfare Forces
- Submarines
- Maritime Patrol Aircraft
- Mine Warfare Forces

If we follow the U.S. Naval strategy, the balanced Navy concept continues to be relevant in the future even though the U.S. Naval Forces shift from "a Cold War, open ocean, blue water naval strategy to a regional, littoral, and expeditionary focus". Therefore I will compare Naval Forces among different countries based on the balanced Navy concept. When we measure relative levels of certain country's naval capabilities to accomplish its mission(s), this concept is one way to compare fleet composition of certain country's navies with that of other countries' navies. It can be allowed to categorize fleet composition into Aircraft Carriers (CV), Ballistic Missile Submarines (SSBN), other Submarines (SS), Cruisers, Destroyers (DD) and Frigates (FF), Mine

Warfare Ships (M/W), Amphibious Warfare Ships (A/W), and others. Both CVs and SSBNs have strategic missions.

B. COMPARISON OF FLEET COMPOSITION

Figures 18 and 19 show fleet compositions with numbers of ships and displacement (full load tons) in natural logarithms respectively in light of the above categories (see Appendices R, S, and T). These include fleet compositions of the entire U.S Navy, U.S. Pacific Fleet, Russian Navy[7], Russian Pacific Fleet, French Navy, U.K. Navy, and the JMSDF.

In terms of number of ships from Figure 18, we can say the following: the U.S. Pacific Fleet is approximately one half of the entire U.S. Navy. The number of SSBNs and SSs in the U.S. Pacific Fleet is, however, one-third of the entire U.S. Navy. Two-thirds of the entire SSBNs and SSs of the U.S. are deployed in the Atlantic Fleet. It shows the U.S. sets the priority of deterrent by SSBNs on the Atlantic Ocean rather than on the Pacific Ocean because the Atlantic Ocean faces NATO allies and Russia. In addition, Mine Warfare Forces of the U.S. Navy are relatively smaller not only than other component forces but also that of the Russian Navy. The U.S. does not deploy diesel submarines. The reason is that the U.S. Navy has emphasized offensive capabilities. The Russian Pacific Fleet makes up one-third of the entire Russian Navy. The French Navy, the U.K. Navy, and the JMSDF take similar shapes. But it's hard to say that this is an appropriate way to measure fleet capabilities, because this

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[7]In this thesis, I will use "Russia" as the word meaning the former U.S.S.R.. In "Military Balance 1992-1993" (The International Institute for Strategic Studies), the word "Russia" is used instead of former U.S.S.R.. Also in "Jane's Fighting Ships 1992-93", the word "Russia and Associated States" is used.

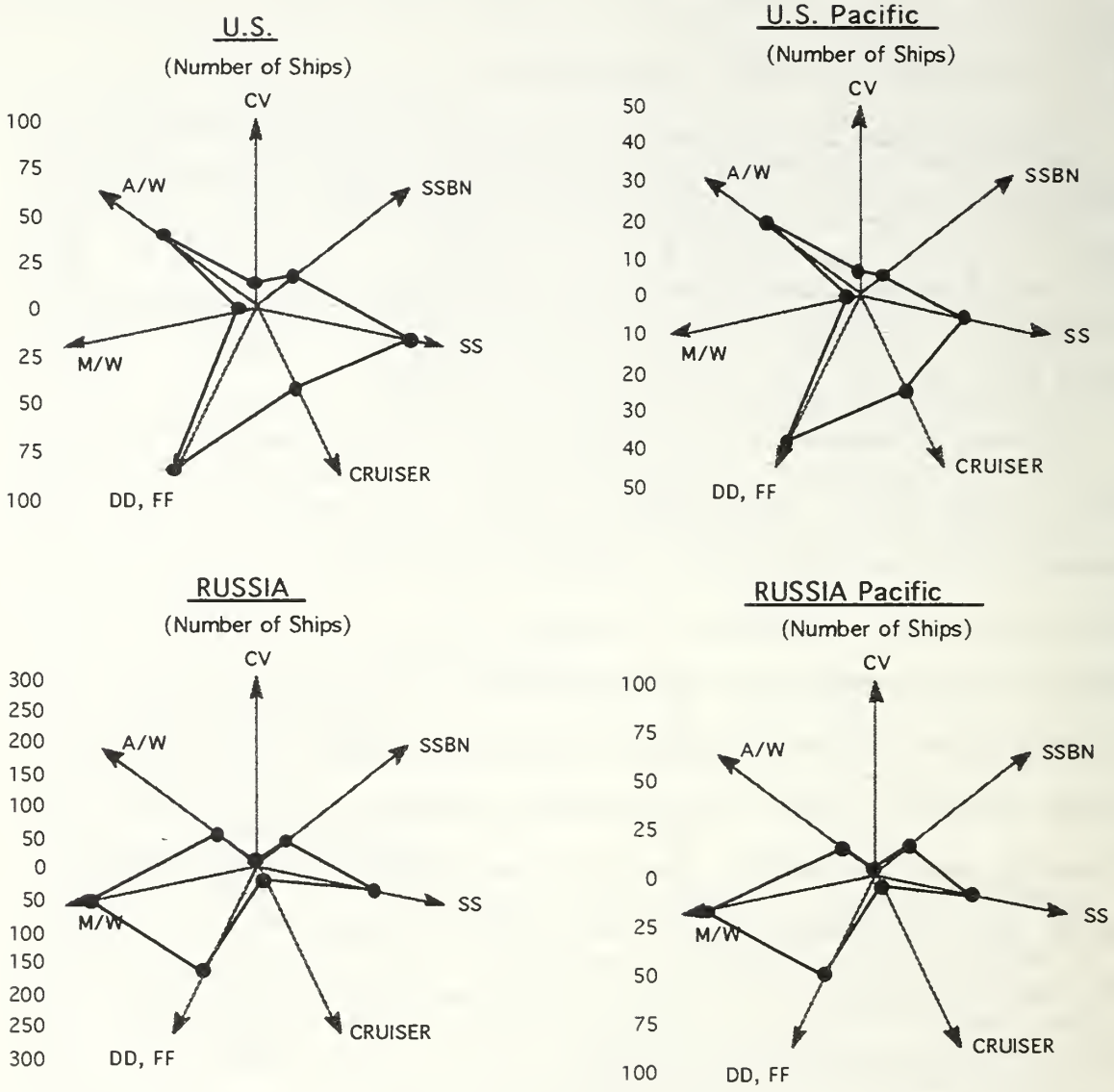
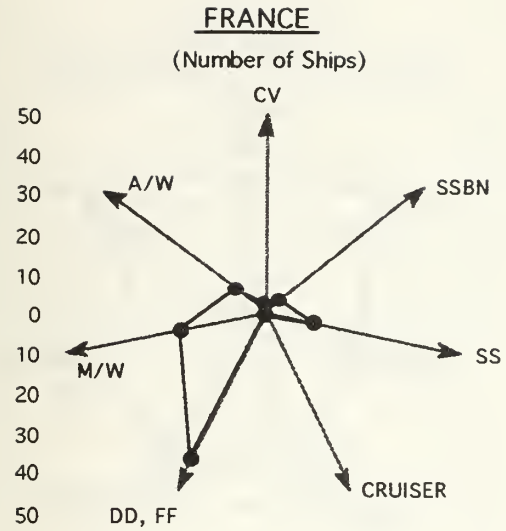
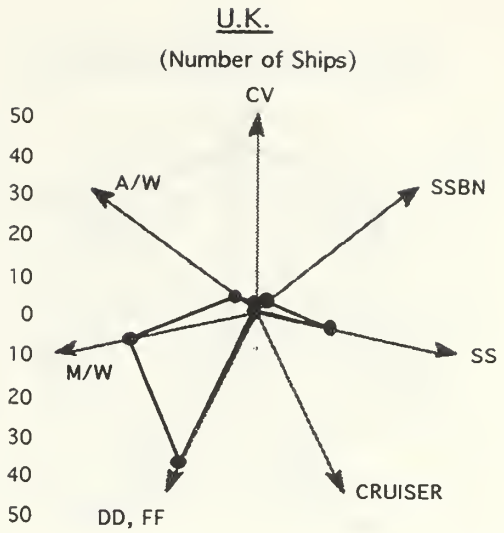


Figure 18

FLEET COMPOSITION (Part 1)
(Number of Ships)





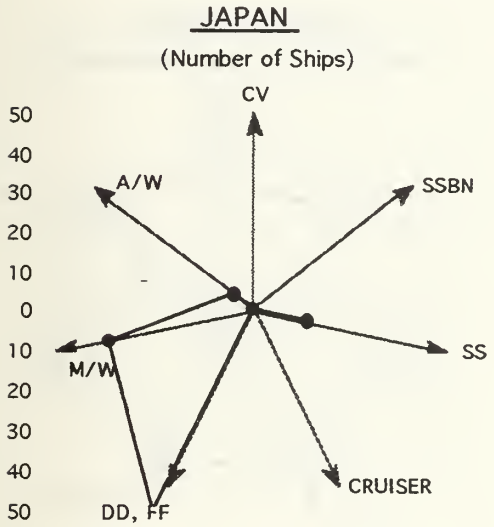


Figure 18

FLEET COMPOSITION (Part 2)
(Number of Ships)

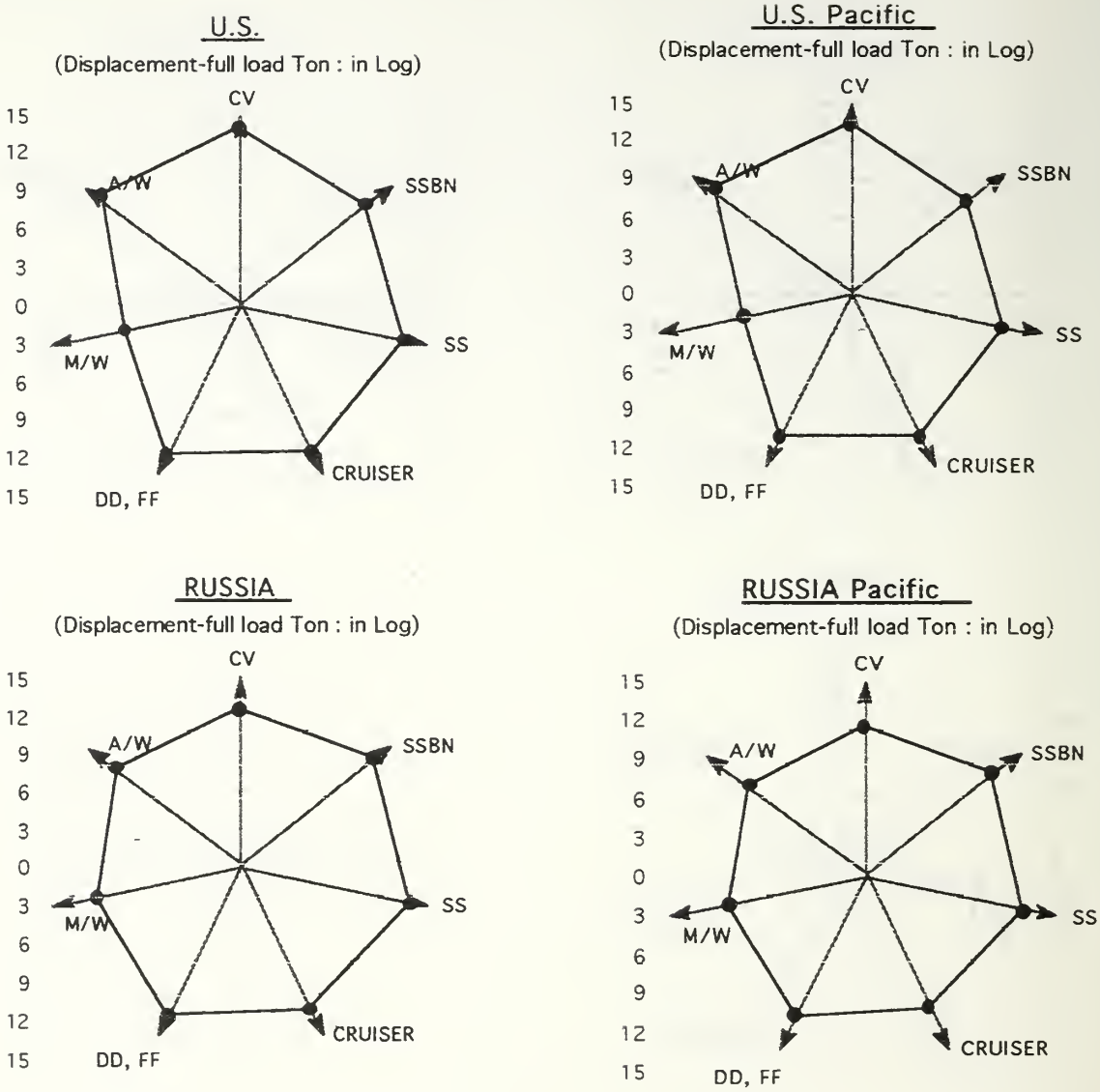


Figure 19

FLEET COMPOSITION (Part 1)
(Displacement, Full Load Ton: In Natural Log.)

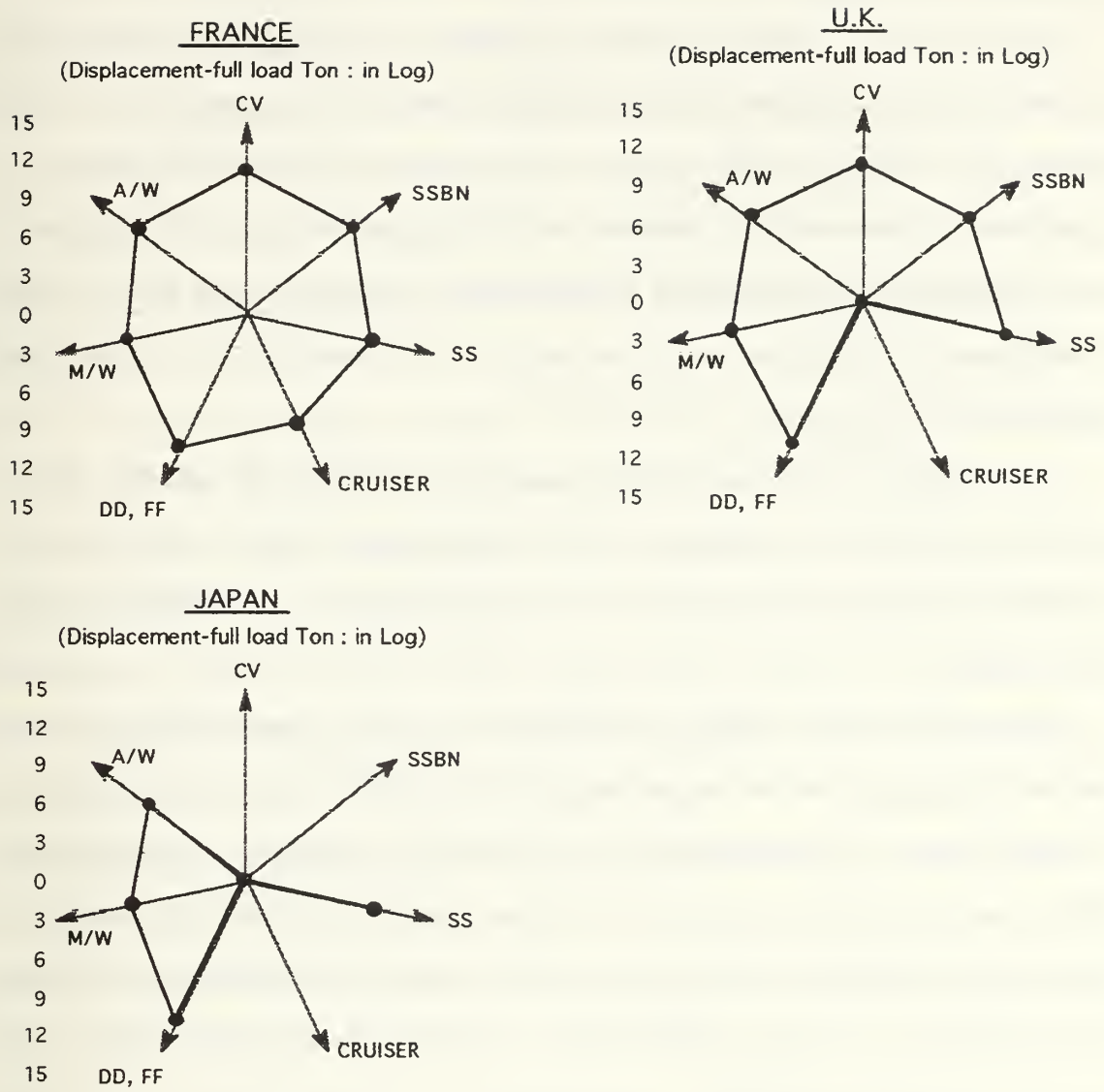


Figure 19

FLEET COMPOSITION (part 2)
(Displacement, Full Load Ton: In Natural Log.)

figure considers the capability of one ship as the same as that of any other ship regardless of its size.

Figure 19, which deals with fleet composition with displacement (full load ton) in natural logarithm, is better than Figure 17 in measuring fleet capability as a whole[8]. Because ship displacement is a good cost driver of shipbuilding, there is a high positive correlation between ship displacement and shipbuilding cost. As seen in different types of ships such as the CV, DD, SSBN, SS, etc., the greater the capability of the ship is, the higher the shipbuilding cost.

From Figure 19, we can see obviously that all the Fleets I listed above except the JMSDF have well balanced fleet compositions and capabilities and the JMSDF looks rather unique in its fleet composition in comparison to the other countries.

With respect to the JMSDF from Figures 18 and 19, many destroyers and mine-sweeping ships are the main feature of the JMSDF's physical ship assets. The JMSDF lacks strategic capability against other countries. Nowadays the JMSDF's destroyers are equipped with anti-air missile systems. These missile systems have difficulties dealing with many targets at the same time because of the limitations of their tracking radars. Therefore from these figures we can also see that the JMSDF has a drawback of no air cover to protect its ships on sea in areas beyond air cover offered by the fighters of the Japan Air Self-Defense Force (JASDF).

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[8]There is another way to measure fleet composition by inventory value that may be the best measure. We have not, however, employed this inventory value measure, which is the dollar value of the different class of ships known, because of the difficulties in comparing different currencies.

C. COMPARISON OF AIRCRAFT ASSETS

Figure 20 is my attempt to show the aircraft asset composition each navy has. I tried categorizing navy combat aircraft into Bomber (BBR) and Fighter (FTR), Anti-submarine Warfare (ASW) Aircraft and Maritime Reconnaissance (MR) aircraft, Electronic Warfare (EW) aircraft, Airborne Early Warning (AEW) aircraft, Commando (CDO) aircraft, and Mine Countermeasure (MCM) aircraft. In the case of aircraft, unlike ships, it will be allowed to consider the capability of one aircraft type as equivalent to other aircraft types even though they have different missions. Therefore I measure aircraft force capability by the number of aircraft in each category.

From Figure 20, although shapes of fleet composition of French Navy, U.K. Navy, and JMSDF took similar shape, in the case of aircraft, they have substantially different aircraft asset compositions. The U.K. has greater aircraft capabilities than France. Major features of the JMSDF are ASW, MR, and MCM aircraft. From Table 5, we can see the qualitative aspects of each countries' aircraft inventories. Figure 21, which shows the totals of land-based ASW maritime patrol aircraft (MPA) in NATO and Japanese forces, also reinforces the JMSDF's ASW feature. Japan has about 14 percent of the total MPA aircraft.

D. CONSISTENCE WITH JAPANESE AUTHORITY

As stated above, many destroyers, mine-sweeping ships, many ASW and MR aircraft, and MCM aircraft are major features of the JMSDF's physical assets. This result should be both intended and well achieved by the Japanese authority.

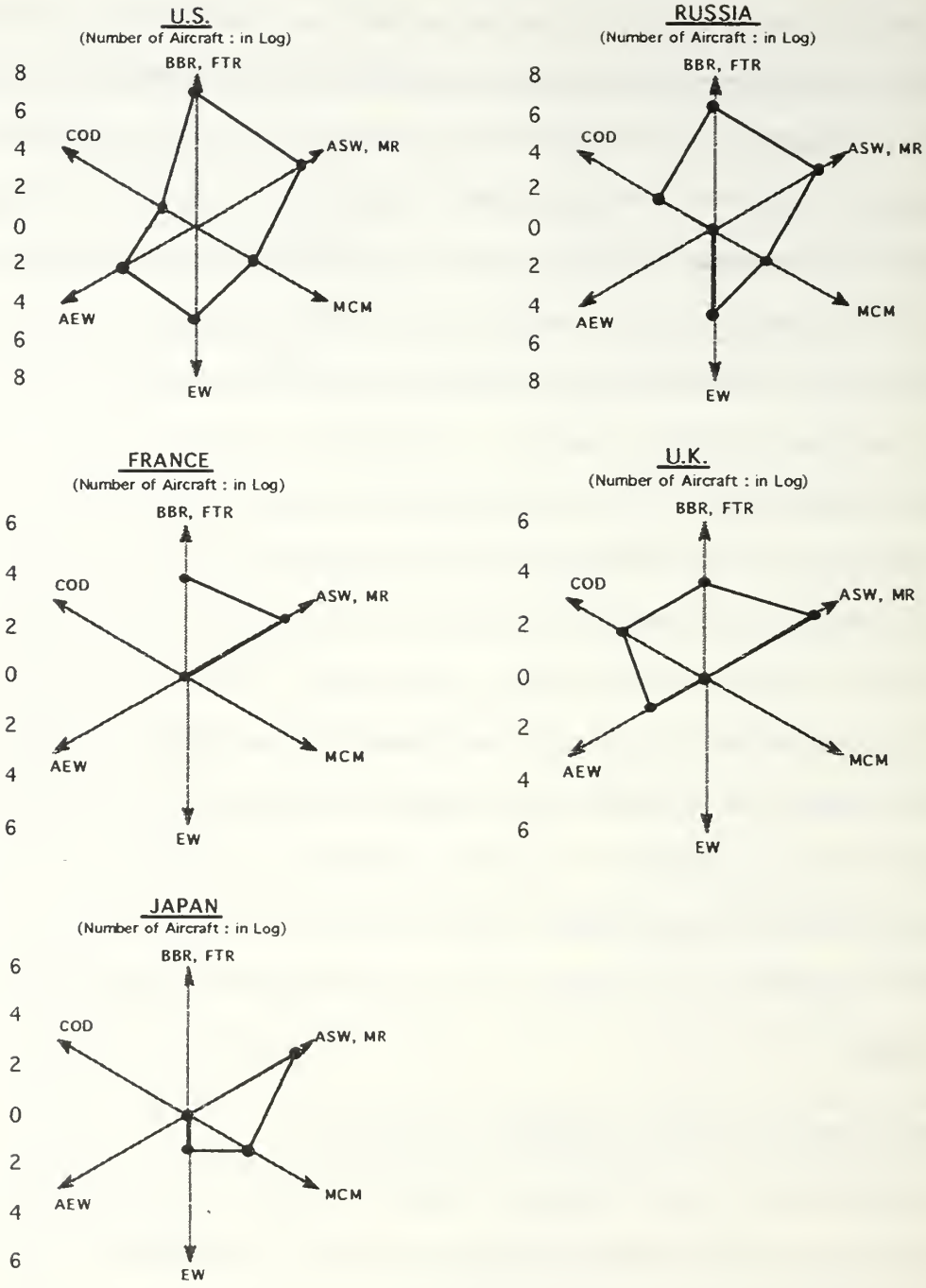


Figure 20

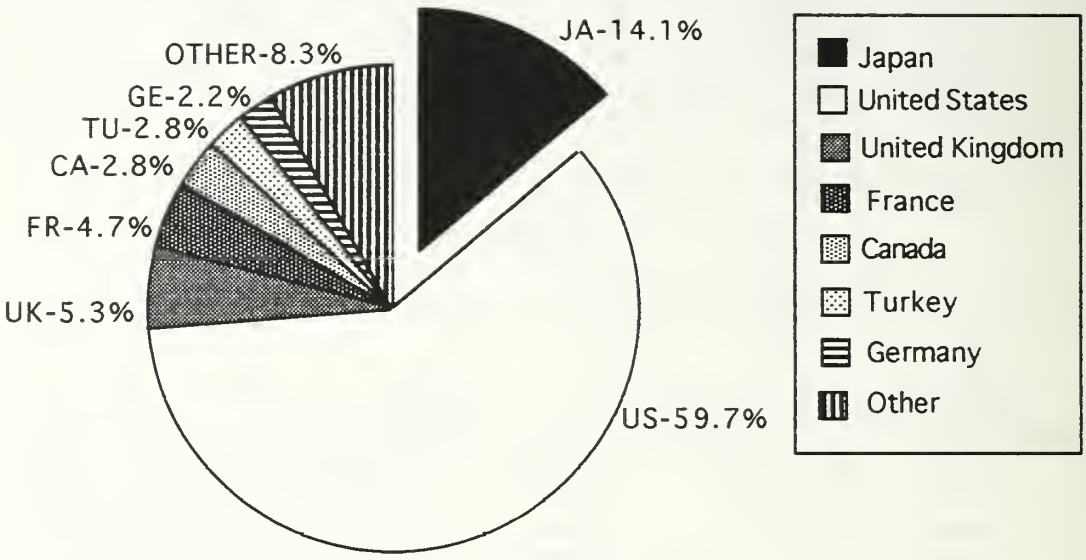
AIRCRAFT ASSET COMPOSITION
(Number of aircraft ; in Natural Log.)

TABLE 5 Contents of Aircraft Assets

AIRCRAFT:	U.S.		RUSSIA		FRANCE		U.K.		JAPAN	
BOMBER			TU-26	155						
			TU-16	70						
STRIKE					SUPER ETENDA	38				
FTR	F-14-A	266	SU-17	165	CRUSADER	12	SEA HARRIER	40		
	F-14-A PLUS	68	SU-24	100						
	F-14-D	41	SU-25	55						
	F/A-18-A	225	MIG-27	30						
	F/A-18-C	283	MIG-29	35						
	A-6-E	279								
ASW	S-3A/B	99	TU-142	58	ALIZE	17				
			II-38	41						
			BE-12	92						
MR	P-3B/C	209	TU-22	5	ATLANTIC	24			P-3C	66
			SU-24	12	ATRANTIQUE	6			P-2J	10
			AN-12	8	GARDIAN	5				
			II-20	2						
EW	EA-6B	109	TU-95	24					EP-2J	2
	EA-3	5	TU-16	39					EP-3C	2
	EP-3	17								
AEW	E-2C	72								
COMMAND	EC-130Q	7								
TRG	F/A-18-B	27			ETENDARD	10	SEA HARRIER	5	KM-2	30
	F/A-18-D	92			ALIZE	8	JETSTREAM	19	P-3C	10
	F-5E/F/T-38	40			ZEPHYR	14	CHIPMUNK	14	QUEEN AIR 65	22
	F-16-N	22			NORD 262	15			T-5	8
	TF-16N	4			NAVAJO	2			TC-90/UC-90	23
	A-4E/F	59			XINGU	11			YS-11T	10
	TA-4F/J	194			RALLYE 880	4				
	TE-2B	10			MS-760	8				
	T-2B/C	150			FALCON 10MER	3				
	T-39D/N	18								
	TA-7C	7								
	T-44	54								
	T-45	16								
MISC		98		59		56		34		22

HELICOPTERS:										
ASW	SH-60B	137	MI-14	69	LYNX	35	SEA KING	51	HSS-2A/B	81
	SH-60F	60	KA-25	85	SA-321	12	LYNX	77		
	SH2F/G	74	KA-27	110						
	SH-3D/G/H	108								
MCM	RH-53D	6	MI-14	25					KV-107A	5
	MH-53E	31							S-80	12
EW			KA-25	25						
AEW							SEA KING	10		
COMMANDO			KA-27	25			SEA KING	34		
TRG	CH-46	231			SA-313	4	SEA KING	25	HSS-2A/B	10
					SA-316/-319	15	GAZELLE HT-2/-3	26	OH-6D/J	12
MISC		16		17		35		0		4

Source: The Military Balance 1992-1993 (the International Institute for Strategic Studies)



Source: Report on Allied Contributions to the Common Defense,
(U.S. Secretary of Defense)
P2-34

Figure 21
ASW Aircraft (in 1988) Total NATO and Japan

We can easily see this authority in the "National Defense Program Outline" (NDPO). The following refers to the posture of the JMSDF in the NDPO.

1. The JMSDF must possess one fleet escort force as a mobile operating ship unit in order to quickly respond to aggressive action and such situations at sea. The fleet escort force must be able to maintain at least one escort flotilla on alert at all times.

2. The JMSDF must possess, as ship units assigned to coastal surveillance and defense, surface anti-submarine capability of at least one ship division in operational readiness at all times in each assigned sea district.

3. The JMSDF must maintain submarine units, anti-submarine helicopter units and minesweeping units, providing the capability for surveillance and defense missions as well as minesweeping at important harbors and major straits when such necessity arises.

4. The JMSDF must maintain fixed-wing anti-submarine aircraft units in order to provide the capability of carrying out missions of surveillance and patrol of the nearby seas and ship protection.

Descriptions of the actual scales of organizations and primary equipment under the foregoing concepts are given in its attachment (see Table 6).

TABLE 6 Inventory Level in JMSDF by NDPO

Basic Units	
Anti-submarine Surface-Ship Units (for mobile operations)	4 Escort Flotillas
Anti-submarine Surface-Ship Units (Regional District Units)	10 Divisions
Submarine Units	6 Divisions
Minesweeping Units	2 Flotillas
Land-based Anti-submarine Aircraft Units	16 Squadrons
Main Equipment	
Anti-submarine Surface Ships	Approx. 60 Ships
Submarines	16 Submarines
Combat Aircraft	Approx. 220 Aircraft

Here we can see that the features of the JMSDF's physical assets are consistent with the contents of the NDPO.

E. COMPLEMENTARY TO THE JMSDF

I assume here again that the entire function of the navy is measured both by the level of fleet composition categorized into CV, SSBN, SS (less SSBN), Cruisers, DD and FF, Mine Warfare Ships, Amphibious Warfare Ships, and others, and by the number of navy combat aircraft categorized into BBR and Fighter, ASW Aircraft and MR aircraft, EW aircraft, AEW aircraft, CDO aircraft, and MCM aircraft.

Figure 22 shows some combinations between the JMSDF and some parts of the U.S. Navy in fleet composition (also see Appendix U). I consider U.S. Navy ships homeported in Japan and one-third of the U.S. Pacific Fleet as some parts of the U.S. Navy. Because they seem to be considered as the marine force

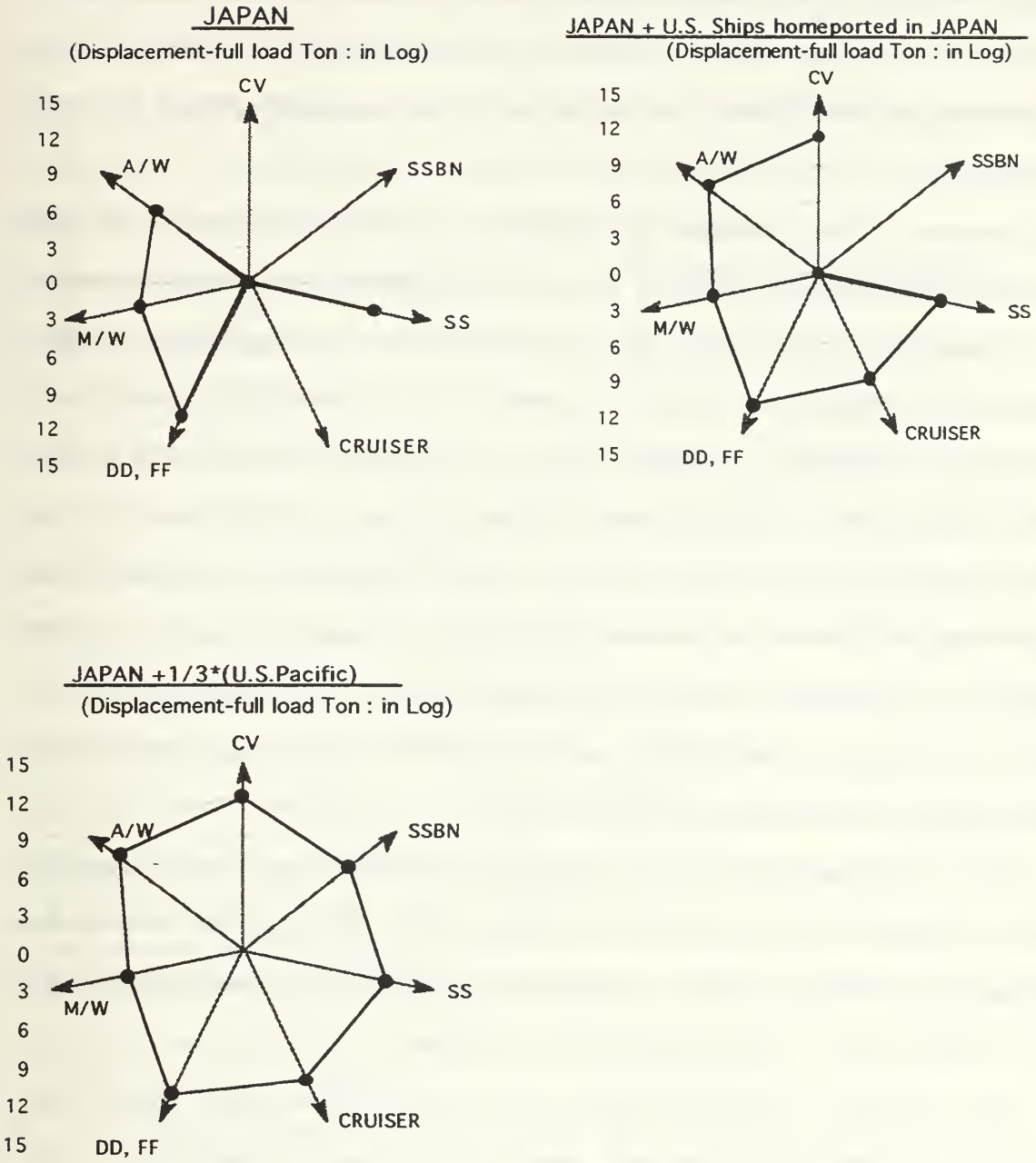


Figure 22

FLEET COMBINATION BETWEEN JAPAN AND U.S.
(Displacement, Full Load Ton: In Natural Log.)

together with the JMSDF which influence sea control in the East Asian Pacific sea area around the island of Japan. It is based on my assumption that approximately one-third of the U.S. Pacific Fleet may be viewed for this purpose.

A cruiser-destroyer-frigate group and an amphibious group of the U.S. Navy are homeported in Japan, as is one aircraft carrier. One aircraft carrier, two cruisers, three destroyers, three frigates, and six amphibious warfare ships are homeported in Japan at present. A combined maritime force between the JMSDF fleet and the U.S. ships homeported in Japan will have a better balanced fleet composition and capability than the JMSDF does by itself. That combined maritime force still lacks SSBN capabilities. Because Japan adheres to the "Three Non-nuclear Principals" as national policy, it is not expected for an SSBN to homeported in Japan. When U.S. ships homeported in Japan conduct operations together with the JMSDF, the U.S. ships supplement the missing air cover function of the JMSDF.

Next, a combined maritime force between the JMSDF and the U.S. Seventh Fleet will have a fleet composition like Figure 22. This maritime force has a completely well-balanced fleet composition. In terms of fleet composition, the U.S. Seventh Fleet is complementary to the JMSDF.

This result is consistent with the concept of maritime operations described in the "Guidelines for Japan-U.S. Defense Cooperation."[9] The following outlines its concept: when an armed attack against Japan takes place, "the JMSDF and the U.S. Navy will jointly conduct maritime operations

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[9]This is the report by the Subcommittee for Defense Cooperation, submitted to and approved by the Japan-U.S. Security Consultative Committee.

for the defense of surrounding waters and the protection of sea lanes of communication. The JMSDF will primarily conduct operations for the protection of major ports and straits in Japan; and anti-submarine operations, operations for the protection of ships and other operations in the surrounding waters. U.S. Navy Forces will support JMSDF operations and conduct operations, including those which may involve the use of task forces providing additional mobility and strike power, with the objective of repelling enemy forces."

While it might be hard to conclude that the JMSDF or Japan is complementary to the U.S. Navy and its physical assets, at least the following can be stated. With the physical assets the JMSDF has, it is obvious that the JMSDF can't perform as many maritime missions as the U.S. Navy. But the JMSDF can conduct substantial anti-submarine warfare operations in the sea area around Japan by using many highly efficient anti-submarine surface ships and anti-submarine maritime patrol aircraft. Needless to say, this JMSDF effort not only contributes to Japan's security directly, but also enhances the U.S. Navy's capability in the far east region. Because the Seventh Fleet has a vast area of responsibility, from the Kamchatka Peninsula of Russia to the Persian Gulf, if her burden around Japan is released by the JMSDF's effort, she can shift her assets to other areas.

F. U.S. MILITARY STRATEGY IN THE ASIA-PACIFIC REGION

The U.S. maritime doctrine or strategic concept is driven by the National Military Strategy of the U.S. which is effected by the U.S. president's National Security Strategy.

The collapse of the Soviet Union and the end of the Cold War has meant that the East-West confrontation that had keynoted the world military situation

for over 40 years has come to an end. Needless to say, this great change has forced a change in the U.S. National Security Strategy. A new U.S. National Security Strategy was announced in August 1991.

A few months later, in January 1992, the National Military Strategy of the U.S. was published. At the beginning of this strategy, it is stated that "Most significant is the shift from containing the spread of communism and deterring Soviet aggression to a more diverse, flexible strategy which is regionally oriented and capable of responding decisively to the challenges of this decade."[10] This strategy is built upon the four foundations of Strategic Deterrence and Defense, Forward Presence, Crisis Response, and Reconstitution.[11] This strategy also states that the U.S. will deter and defend against strategic nuclear attacks as the U.S. has for the past forty years and also project a forward presence and provide crisis responses as fundamental parts of its regionally oriented strategy.

The U.S. remains an Asia-Pacific power with interests in East Asia. The U.S. Department of Defense has stated, "Despite the decade of change that we foresee, our regional interests in Asia will remain similar to those we have pursued in the past. With a total two-way transpacific trade exceeding 300 billion dollars annually, 50 percent more than our transatlantic trade, it is in our own best interest to help preserve peace and stability. The principal elements of our Asian strategy -- forward deployed forces, overseas bases, and bilateral security arrangements -- will remain valid and essential to

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[10]The National Military Strategy of the United States (Chairman Joint Chiefs of Staff) P1

[11]The National Military Strategy of the United States (Chairman Joint Chiefs of Staff) P6

maintaining regional stability, deterring aggression, and preserving U.S. interests."[12] U.S. interests in this region require a continuing commitment. Therefore forward presence forces in this region are essential to the U.S. Military Strategy. "Forward presence forces will be principally maritime. The U.S. plans to keep one aircraft carrier battle group and an amphibious ready group homeported in Japan and has developed new forward options not dependent upon U.S.'s former bases in the Philippines."[13]

G. COMPLEMENTARY TO THE U.S. NAVY

As seen in the new U.S. Military strategy, in spite of the great changes in the international situation, forward presence still remains as one of the four foundations of new U.S. Military strategy. This is because of the U.S. perception that over the past 45 years, the day-to-day presence of U.S. forces in regions vital to U.S. national interests has been key to averting crises and preventing war. "In addition to forces stationed overseas and afloat, forward presence includes periodic and rational deployments, access and storage agreements, combined exercises, security and humanitarian assistance, port visits, and military-to-military contacts."[14]

By considering this U.S. Military strategy, we can conclude that Japan or the JMSDF is complementary to U.S. Navy strategy. Japan provides bases and facilities and capabilities which accommodate CVs. "It is in the U.S. interest to

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[12]A Strategic Framework for the Asian Pacific Rim; Looking Toward the 21st Century (Department of Defense, 1990) P8

[13]The National Military Strategy of the United States (Chairman Joint Chiefs of Staff) P22

[14]The National Military Strategy of the United States (Chairman Joint Chiefs of Staff) P7

maintain a forward deployed presence in Japan over the long-term for two reasons: the geostrategic location of bases and the cost effectiveness of U.S. presence compared to anywhere else."[15]

Therefore Japan contributes to the U.S.'s Forward presence.

H. COOPERATION IN NAVAL ACTIVITIES

It is important to understand the level of cooperative activities between the JMSDF and the U.S. Navy. From the U.S. perspective, cooperation is part of the U.S. extending a forward presence. It serves to promote better mutual understanding and close communications. As a result, it also serves to upgrade interoperability between forces. Therefore regular combined training and other types of cooperative activities are indispensable to ensure smooth cooperation of JMSDF-U.S. Navy actions in the event of any emergencies involving Japan.

The JMSDF has been involved in the following Japan-U.S. combined training activities (also see Table 7):

1. RIM OF THE PACIFIC (RIMPAC) EXERCISE is a comprehensive exercise projected by the U.S. 3rd Fleet and is conducted every other year in the eastern Pacific Ocean. Ships of foreign countries, such as Canada, Australia, and New Zealand, participate in this exercise. The JMSDF took part in RIMPAC in 1980 for the first time and has participated in every exercise since then. Eight DD's (Destroyer), one AOE (Fast Combat Support Ship), and eight P-3C's out of the JMSDF took part in RIMPAC '90.

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[15]A Strategic Framework for the Asian Pacific Rim; Looking Toward the 21st Century (Department of Defense, 1990) P17

TABLE 7
Performance of JMSDF-U.S. Navy Combined Training in FY1991

Exercise Designation	Date	Place	Participating Forces Japan	Participating Forces U.S.	Outline
Special Anti-submarine Training	May 8-12, 1991	Sea area extending south of Boso to east of Ogasawara Islands	9 vessels 7 aircraft (combined total)	4 vessels 14 aircraft (combined total)	Anti-submarine training, Air defense training, Electronic warfare training, etc.
Special Anti-submarine Training	June 18-24, 1992	Sea area south-west of Kyushu	8 vessels 9 aircraft (combined total)	2 vessels 6 aircraft (combined total)	Anti-submarine training, Air defense training, Electronic warfare training, etc.
Special Anti-submarine Training	August 23-28, 1991	Sea area south-west of Kyushu	8 vessels 8 aircraft (combined total)	2 vessels 5 aircraft (combined total)	Anti-submarine training, Air defense training, Electronic warfare training, etc.
Special Anti-submarine Training	October 8-11, 1991	Sea area south-west of Kyushu	8 vessels 5 aircraft (combined total)	1 vessel 6 aircraft (combined total)	Anti-submarine training, Air defense training, Electronic warfare training, etc.
Japan-U.S. Combined Training in JMSDF Exercise	November 8-15, 1991	Sea area south and east of Honshu	15 vessels 90 aircraft (combined total)	17 vessels (including the aircraft carrier Independence, Lincoln) About 160 aircraft (combined total)	Anti-submarine training, Air defense training, Electronic warfare training, etc.
Special Mine-Sweeping Training	February 15-27, 1992	Suonada Sea	25 vessels 26 aircraft (combined total)	4 aircraft (combined total)	Minesweeping training
Special Anti-submarine Training	February 24-29, 1992	Sea area south-west of Kyushu	6 vessels 13 aircraft (combined total)	6 vessels 13 aircraft (combined total)	Anti-submarine training, Air defense training, Electronic warfare training, etc.
Command Post Exercise	March 15-28, 1992	U.S. Naval War College	20 from the JMSDF Staff Office, etc.	About 50 from the 7th Fleet, U.S. Naval Forces, Japan, Headquarters, etc.	Training on coordination

Source : Defense of Japan (Defense Agency, Japan) P231

2. A JMSDF-U.S. Navy Combined Exercise is conducted in the sea area from Hawaii to California every other year when the RIMPAC exercise is not conducted. Three DD's and five P-3C's out of the JMSDF take part in this exercise.

3. Special Anti-Submarine Warfare Training is conducted several times each year in the sea area around Japan between the JMSDF and the U.S. Navy.

4. Special Mine-Sweeping Training is conducted yearly.

5. The JMSDF Annual Exercise is the biggest exercise in which almost all ships, aircraft, and personnel in the JMSDF are involved. As a part of this exercise, JMSDF-U.S. Navy combined training is conducted. A U.S. Navy aircraft carrier usually takes part in this exercise.

6. The first Japan-U.S. combined command post exercise was conducted in 1989 at the U.S. Naval War College and has been conducted yearly since then.

I. LEVEL OF COMPLEMENTARITY AND FUTURE TRENDS

It has been found that there is a high level of complementarity between the JMSDF and the U.S. Navy either in terms of fleet composition, military strategy, or cooperation in naval activities. Japan's complementary relationship with the U.S. will most likely continue in the future. Assuming that this complementary relationship continues, as I examined in Section II the JMSDF will probably not have sufficient financial resources in the future to enhance its naval forces over the current levels. However, if the complementary relationship with the U.S. continues, Japan will not need a balanced maritime force. It is also anticipated that Japan will continue to

maintain a defensive strategy and improve its current complementary relationship with the U.S..

On the other hand, the U.S. Navy considers that U.S. Navy forces can operate with other elements of joint or combined task forces, including allied forces and assets in order to respond to U.S. national needs. Also the U.S. itself may not prefer that Japan enhance its military beyond its current force level. The Department of Defense in the U.S. stated that "Increases in Japanese military strength undertaken to compensate for declining U.S. capabilities in the region could prove worrisome to regional nations, especially if they perceive Japan is acting independent of the U.S.-Japan security relationship."[16] The U.S. stresses "the importance of maintaining interoperability in our military weapons systems by encouraging maximum procurement from the U.S., increasing technology flowback, and discouraging the development of non-complementary systems."[17] Also in November 1991, the U.S. Secretary of Defense, the Honorable Richard Cheney, unveiled complementary defense cooperation as one principle of U.S. strategy for East Asia.

Taking into account the above factors, there is little likelihood for the JMSDF to take a separate path from the current complementary relationship with the U.S. Navy.

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[16]A Strategic Framework for the Asian Pacific Rim: Looking Toward the 21st Century (Department of Defense, 1990) P6

[17]A Strategic Framework for the Asian Pacific Rim: Looking Toward the 21st Century (Department of Defense, 1990) P18

VI. CONCLUSION

As I stated at the outset, one of the primary research questions was "Does the JMSDF have the financial resources to improve its forces in the future?" Another question was "What has been and will be the level of complementarity between the JMSDF and the U.S. Navy?" For the first question, throughout Section II we find that if about 1 percent of GNP will be allocated to the JMSDF budget and GNP will continue to increase as in the past, and assuming that the total number of major ships is fixed like the current situation, it might be possible for the JMSDF to make larger and more modern ships without serious financial problems. When we take into account, however, the coming aging society and other social welfare issues, the JMSDF budget may not be allocated the same as it has in the past. The average real growth rate of the Japanese economy in the future might be lower than that of the past. The introduction of advanced technological systems to ships and/or aircraft will require substantive additional costs. This leads me to conclude that the JMSDF is not likely to be allocated enough financial resources to enhance its inventory much beyond its current force level. This situation tends to lead Japan to continue on a complementary relationship with the U.S..

With respect to the second question, the examination reveals that there is a high level of complementarity overall between the JMSDF and the U.S. Pacific Fleet. This relationship will most likely continue in the future.

Therefore it is concluded that the future direction of the JMSDF will be that of keeping an effective complementary relationship with that of the U.S. Navy.

APPENDIX A

BASIC POLICY FOR JAPAN'S NATIONAL DEFENSE

The objective of national defense is to prevent direct and indirect aggression, but once invaded, to repel such action, thereby preserving the independence and peace of Japan founded upon democratic principles.

To achieve this objective, the government of Japan hereby establishes the following principles:

1. To support the activities of the United Nations and promote international cooperation, thereby contributing to the realization of world peace.

2. To promote public welfare and enhance the people's love for the country, thereby establishing the sound basis essential to Japan's security.

3. To develop progressively the effective defense capabilities necessary for self-defense, with regard to the nation's resources and the prevailing domestic situation.

4. To deal with external aggression on the basis of the Japan-U.S. security arrangements, pending the effective functioning of the United Nations in the future in deterring and repelling such aggression.

Source : Defense of Japan (Defense Agency, Japan)

APPENDIX B

BRIEF ON JAPAN'S DEFENSE PROGRAMS POLICIES

1. First Defense Buildup Plan(FY1958-1960)
-Constructing a fundamental ground defense capability in order to cope with the rapid reductions in U.S. ground forces stationed in Japan
-Establishing maritime and air defense capability

3. Second Defense Buildup Plan(FY1962-1966)
-Strengthening that defense potential to the point of capability in meeting conventional aggression on a scale no greater than localized conflict

3. Third Defense Buildup Plan(FY1967-1971)
-Consolidation of the most effective defense potential capable of meeting conventional aggression on a scale no greater than localized conflict

4. Fourth Defense Buildup Plan(FY 1972-1976)
-Following up the third plan

5. Mid-Term Defense Program(FY1986-1990)
-to attain the level of defense capability laid down in the National Defense Program Outline (NDPO)
-to upgrade the defense capability enough to match the international military situation and trends in the technological gains of other countries
-the furtherance of systematically coordinated relations among the three self-defense forces and the demonstration of joint operational effects

6. New Mid-Term Defense Program (FY1991-1995)
-to maintain efficiently the level of defense capability laid down in the NDPO
-to maintain and enhance the credibility of the Japan-U.S. Security Arrangements
-to maintain a well-balanced posture in all dimensions

Source : Defense of Japan (Defense Agency, Japan)

APPENDIX C

OUTLINE OF JAPAN'S DEFENSE BUILDUP FOR THE FUTURE

1. First of all, Japan will stick steadfastly to its exclusive defense policy under the peace constitution. At the same time, Japan, holding fast to the Japan-U.S. Security arrangements, will continue maintaining the basic defense policy it has pursued over the past years, including the moderate improvement of its defense capability.

2. The defense-related expenditure for each fiscal year during the enforcement period of the Mid-Term Defense Program is decided within the framework of required expenses set forth in this program. And the total amount of expenses is set as the actual ceiling of defense expenditure for the five years of the program that was scheduled to be prepared anew three years henceforth.

3. As regards defense-related expenditures in and after fiscal 1991, it will be decided by the time the Mid-Term Defense Program is completed, in accordance with Japan's basic policy as a peace-loving nation by taking into consideration factors such as the international situation, and economic and fiscal situations.

4. Furthermore, considering that the decision on "Defense Buildup for the Time Being" in 1976 has so far played a vital role as a guideline for the defense buildup expenses, the government, with this well in mind, will continue holding in high esteem the spirit of the decision calling for a moderate defense buildup.

Source: Summary of Defense of Japan 1988 (Defense Agency, Japan) P89

APPENDIX D

CHANGES IN JAPAN'S DEFENSE EXPENDITURES

(Unit:100 million Yen, %)

FY	1958	1959	1960	1961	1962	1963	1964	1965
Defence (DE)	1,485	1,560	1,569	1,803	2,085	2,412	2,751	3,014
GNP	102,470	107,620	127,480	156,200	176,700	203,900	240,700	281,600
BUDGET	13,121	14,192	15,697	19,528	24,268	28,500	32,554	36,581
Ratio(%)								
(1)DE/GNP	1.45%	1.45%	1.23%	1.15%	1.18%	1.18%	1.14%	1.07%
(2)DE/BUDGET	11.32%	10.99%	10.00%	9.23%	8.59%	8.46%	8.45%	8.24%

FY	1966	1967	1968	1969	1970	1971	1972	1973
Defence (DE)	3,407	3,809	4,221	4,838	5,695	6,709	8,002	9,355
GNP	308,500	409,500	478,400	578,600	724,400	843,200	905,500	1,098,000
BUDGET	43,143	49,509	58,185	67,395	79,497	94,143	114,677	142,841
Ratio(%)								
(1)DE/GNP	1.10%	0.93%	0.88%	0.84%	0.79%	0.80%	0.88%	0.85%
(2)DE/BUDGET	7.90%	7.69%	7.25%	7.18%	7.16%	7.13%	6.98%	6.55%

FY	1974	1975	1976	1977	1978	1979	1980	1981
Defence (DE)	10,930	13,273	15,124	16,906	19,010	20,945	22,302	24,000
GNP	1,315,000	1,585,000	1,681,000	1,928,500	2,106,000	2,320,000	2,478,000	2,648,000
(2)DE/BUDGET	170,994	212,888	242,960	285,143	342,950	386,001	425,888	467,881
Ratio(%)								
(1)DE/GNP	0.83%	0.84%	0.90%	0.88%	0.90%	0.90%	0.90%	0.91%
(2)DE/BUDGET	6.39%	6.23%	6.22%	5.93%	5.54%	5.43%	5.24%	5.13%

FY	1982	1983	1984	1985	1986	1987	1988	1989
Defence (DE)	25,861	27,542	29,346	31,371	33,435	35,174	37,003	39,198
GNP	2,772,000	2,817,000	2,960,000	3,146,000	3,367,000	3,504,000	3,652,000	3,897,000
BUDGET	496,808	503,796	506,272	524,996	540,886	541,010	566,997	604,142
Ratio(%)								
(1)DE/GNP	0.93%	0.98%	0.99%	0.997%	0.993%	1.004%	1.013%	1.006%
(2)DE/BUDGET	5.21%	5.47%	5.80%	5.98%	6.18%	6.50%	6.53%	6.49%

FY	1990	1991	1992
Defence (DE)	41,593	43,860	45,518
GNP	4,172,000	4,596,000	4,837,000
BUDGET	662,368	703,474	722,180
Ratio(%)			
(1)DE/GNP	0.997%	0.954%	0.941%
(2)DE/BUDGET	6.28%	6.23%	6.30%

Source: Boei Handbook (Asagumo Shinbunsha) P228-230

note: 1. BUDGET is shown by Original Budget.

2. GNP is Shown by Initial forecasted GNP.

APPENDIX E

CHANGE IN JAPAN'S MAJOR GENERAL ACCOUNT EXPENDITURES (Original Budget)

(Unit:100 million Yen Expressed in Nominal Term)

Fiscal Year	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Social Welfare	21,154	28,919	39,282	48,076	56,919	67,811	76,266	82,124	88,369	90,848	91,398
Education & Science	15,708	19,633	26,401	30,292	34,301	38,516	42,997	45,250	47,420	48,637	48,186
Defense	9,355	10,930	13,273	15,124	16,906	19,010	20,945	22,302	24,000	25,861	27,542
Public Works	28,408	28,407	29,095	35,272	42,810	54,501	65,401	66,554	66,554	66,554	66,554
Others	68,221	83,105	104,837	114,196	134,207	163,112	180,392	209,659	241,537	264,906	270,116
Total	142,846	170,994	212,888	242,960	285,143	342,950	386,001	425,889	467,880	496,806	503,796

Fiscal Year	1984	1985	1986	1987	1988	1989	1990	1991	1992
Social Welfare	93,210	95,736	98,346	100,896	103,845	108,947	116,148	122,122	127,374
Education & Science	48,665	48,409	48,445	48,497	48,581	49,371	51,129	53,944	56,834
Defense	29,346	31,371	33,435	35,174	37,003	39,198	41,593	43,870	45,518
Public Works	65,200	63,689	62,233	60,824	60,824	61,974	62,147	65,897	69,409
Others	269,849	285,792	298,426	295,618	316,744	344,653	391,350	417,641	412,212
Total	506,270	524,997	540,885	541,009	566,997	604,143	662,367	703,474	711,347

Source: Kaijojieitai Yosan Jimuteiyo (Kaijobakuryokanbu)

APPENDIX F

TRENDS IN JAPAN'S DEFENSE EXPENDITURES (By Expenses)

(Unit: 1000Yen, Expressed in nominal term)

FISCAL YEAR	1974	1975	1976	1977	1978	1979	1980
PERSONNEL & PROVISIONS	529,646,420	702,088,220	847,656,901	930,391,598	1,034,505,944	1,076,450,985	1,099,977,831
CURRENT-YEAR MATERIAL	304,785,726	352,767,151	372,498,221	408,649,106	468,851,617	572,411,176	607,885,174
CURRENT-YEAR OBLIGATORY OUTLAY	258,591,749	272,466,501	292,195,474	351,572,621	397,672,032	445,627,130	522,339,473
TOTAL	1,093,023,895	1,327,321,872	1,512,350,596	1,690,613,325	1,901,029,593	2,094,489,291	2,230,202,478

FISCAL YEAR	1981	1982	1983	1984	1985	1986	1987
PERSONNEL & PROVISIONS	1,144,369,784	1,205,311,648	1,225,824,750	1,309,441,289	1,413,952,438	1,508,551,282	1,543,867,016
CURRENT-YEAR MATERIAL	631,062,141	679,339,320	673,185,236	642,070,591	649,725,434	665,137,387	708,593,611
CURRENT-YEAR OBLIGATORY OUTLAY	624,586,984	701,484,503	855,224,397	983,132,904	1,073,470,276	1,169,860,401	1,264,973,154
TOTAL	2,400,018,909	2,586,135,471	2,754,234,383	2,934,644,784	3,137,148,148	3,343,549,070	3,517,433,781

FISCAL YEAR	1988	1989	1990	1991
PERSONNEL & PROVISIONS	1,578,864,769	1,613,580,741	1,668,028,636	1,756,766,471
CURRENT-YEAR MATERIAL	770,487,217	838,074,880	908,434,203	929,152,825
CURRENT-YEAR OBLIGATORY OUTLAY	1,350,975,954	1,467,178,674	1,582,878,247	1,700,115,710
TOTAL	3,700,327,940	3,918,834,295	4,159,341,086	4,386,035,006

Source: Kaijojieitai Yosan Jlmuteiyo (Kaijobakuryokanbu)

APPENDIX G

TRENDS IN JAPAN'S DEFENSE EXPENDITURES (by Organization)

(Unit: 1000Yen, Expressed in nominal term)

FISCAL YEAR	1974	1975	1976	1977	1978	1979	1980
JGSDF BUDGET	436,063,610	556,630,000	651,653,279	714,429,431	799,065,903	859,871,056	887,274,653
JMSDF BUDGET	238,992,567	268,047,521	314,051,000	357,156,190	421,108,858	454,003,847	509,657,110
JASDF BUDGET	279,999,635	335,587,135	362,179,754	413,594,535	437,841,542	482,653,097	514,435,291
OTHERS BUDGET	137,968,083	167,057,216	184,466,563	205,433,169	243,013,290	297,961,291	318,835,424
TOTAL	1,093,023,895	1,327,321,872	1,512,350,596	1,690,613,325	1,901,029,593	2,094,489,291	2,230,202,478

FISCAL YEAR	1981	1982	1983	1984	1985	1986	1987
JGSDF BUDGET	944,307,702	986,020,584	1,027,337,475	1,077,538,962	1,161,200,110	1,249,516,952	1,286,199,804
JMSDF BUDGET	553,162,912	602,902,259	654,037,117	705,983,574	733,266,575	793,286,424	861,548,204
JASDF BUDGET	564,635,120	633,668,319	699,426,640	758,720,730	827,518,662	870,559,587	898,284,910
OTHERS BUDGET	337,913,175	363,544,309	373,433,151	392,401,518	415,162,801	430,186,107	471,400,863
TOTAL	2,400,018,909	2,586,135,471	2,754,234,383	2,934,644,784	3,137,148,148	3,343,549,070	3,517,433,781

FISCAL YEAR	1988	1989	1990	1991	1992
JGSDF BUDGET	1,330,266,311	1,379,272,640	1,474,852,513	1,563,154,276	1,633,400,000
JMSDF BUDGET	940,748,823	971,559,836	976,022,583	1,085,383,204	1,100,200,000
JASDF BUDGET	934,169,264	1,030,049,496	1,121,705,999	1,118,218,270	1,153,200,000
OTHERS BUDGET	495,143,542	537,952,323	586,759,991	619,279,256	665,100,000
TOTAL	3,700,327,940	3,918,834,295	4,159,341,086	4,386,035,006	4,551,700,000

Source: Kaijojieitai Yosan Jimuteiyo (Kaijobakuryokanbu)

APPENDIX H

TRENDS IN EACH SERVICE'S BUDGET AS A PERCENTAGE OF GNP (by Organization) IN JAPAN

FISCAL YEAR	1974	1975	1976	1977	1978	1979
JGSDF BUDGET	0.332%	0.351%	0.388%	0.370%	0.379%	0.371%
JMSDF BUDGET	0.182%	0.169%	0.187%	0.185%	0.200%	0.196%
JASDF BUDGET	0.213%	0.212%	0.215%	0.214%	0.208%	0.208%
OTHER'S BUDGET	0.105%	0.105%	0.110%	0.107%	0.115%	0.128%
TOTAL	0.831%	0.837%	0.900%	0.877%	0.903%	0.903%

FISCAL YEAR	1980	1981	1982	1983	1984	1985
JGSDF BUDGET	0.358%	0.357%	0.356%	0.365%	0.364%	0.369%
JMSDF BUDGET	0.206%	0.209%	0.217%	0.232%	0.239%	0.233%
JASDF BUDGET	0.208%	0.213%	0.229%	0.248%	0.256%	0.263%
OTHER'S BUDGET	0.129%	0.128%	0.131%	0.133%	0.133%	0.132%
TOTAL	0.900%	0.906%	0.933%	0.978%	0.991%	0.997%

FISCAL YEAR	1986	1987	1988	1989	1990	1991
JGSDF BUDGET	0.371%	0.367%	0.364%	0.354%	0.354%	0.340%
JMSDF BUDGET	0.236%	0.246%	0.258%	0.249%	0.234%	0.236%
JASDF BUDGET	0.259%	0.256%	0.256%	0.264%	0.269%	0.243%
OTHER'S BUDGET	0.128%	0.135%	0.136%	0.138%	0.141%	0.135%
TOTAL	0.993%	1.004%	1.013%	1.006%	0.997%	0.954%

Source : Kaijojieitai Yosan Jimuteiyo (Kaijobakuryokanbu)

APPENDIX I

TRENDS IN JMSDF BUDGET (by Expenses)

(Unit : 1000Yen, Expressed in nominal term)

FISCAL YEAR	1974	1975	1976	1977	1978
PERSONNEL & PROVISIONS	94,699,262	122,846,066	149,937,055	163,262,653	179,762,677
CURRENT-YEAR OBLIGATORY OUTLAY	88,474,142	78,643,333	93,336,011	117,989,670	156,902,314
CURRENT-YEAR MATERIAL	55,819,163	66,558,122	70,777,934	75,903,867	84,443,867
TOTAL	238,992,567	268,047,521	314,051,000	357,156,190	421,108,858

FISCAL YEAR	1979	1980	1981	1982	1983
PERSONNEL & PROVISIONS	185,334,281	191,297,957	203,530,509	219,986,573	221,455,053
CURRENT-YEAR OBLIGATORY OUTLAY	166,073,958	208,331,903	235,123,960	256,648,036	307,216,830
CURRENT-YEAR MATERIAL	102,595,608	110,027,250	114,508,443	126,267,650	125,365,234
TOTAL	454,003,847	509,657,110	553,162,912	602,902,259	654,037,117

FISCAL YEAR	1984	1985	1986	1987	1988
PERSONNEL & PROVISIONS	241,612,693	258,862,767	282,669,925	301,194,097	310,677,258
CURRENT-YEAR OBLIGATORY OUTLAY	351,878,604	358,749,604	392,317,167	437,329,163	489,198,578
CURRENT-YEAR MATERIAL	112,492,277	115,654,204	118,299,332	123,024,944	140,872,987
TOTAL	705,983,574	733,266,575	793,286,424	861,548,204	940,748,823

FISCAL YEAR	1989	1990	1991	1992
PERSONNEL & PROVISIONS	311,969,791	317,413,953	331,612,132	352,100,000
CURRENT-YEAR OBLIGATORY OUTLAY	504,890,583	487,397,898	581,473,610	583,400,000
CURRENT-YEAR MATERIAL	154,699,462	171,210,732	172,297,462	168,500,000
TOTAL	971,559,836	976,022,583	1,085,383,204	1,104,000,000

Source : Kaijojieitai Yosan Jimuteiyo (Kaijobakuryokanbu)

APPENDIX J

TRENDS IN JMSDF BUDGET (by 3 Components)

(Unit: 1000 Yen, Expressed in nominal term)

FISCAL YEAR	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964
1. Personnel & Provisions	3,751,705	5,551,961	6,688,630	7,106,355	8,121,650	9,586,280	11,382,979	13,734,107	16,024,315	18,964,681
Personnel	**	**	**	**	**	**	**	**	**	**
Provisions	**	**	**	**	**	**	**	**	**	**
2. Front-Line	5,544,680	8,165,571	5,200,543	7,133,104	11,267,817	13,480,314	15,014,571	14,436,714	13,305,675	16,520,257
Ship	5,544,680	7,804,378	5,200,543	6,711,416	8,195,834	9,460,712	8,005,970	6,967,694	9,526,228	10,717,186
Aircraft	0	361,193	0	421,688	3,070,243	3,984,413	6,011,726	6,016,785	2,270,371	3,960,605
Amunition	0	0	0	0	1,740	35,189	996,875	1,452,235	1,509,076	1,842,466
3. Others	9,715,952	9,137,007	10,035,936	11,430,341	12,813,561	13,525,306	16,025,476	19,295,435	22,504,971	22,556,593
4. TOTAL	19,012,337	22,854,539	21,925,109	25,669,800	32,203,028	36,591,900	42,423,026	47,466,256	51,834,961	58,041,531

FISCAL YEAR	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
1. Personnel & Provisions	22,702,398	25,731,298	28,931,137	33,429,846	38,523,576	45,595,607	54,233,668	64,296,981	76,188,068	94,699,262
Personnel	**	**	**	**	**	42,431,809	50,738,044	60,446,785	71,863,917	89,787,989
Provisions	**	**	**	**	**	3,163,798	3,495,624	3,850,196	4,324,151	4,911,273
2. Front-Line	19,933,305	20,398,770	23,371,295	27,669,137	36,850,351	51,097,600	64,076,797	74,074,522	76,220,965	76,302,541
Ship	13,657,606	14,836,034	17,220,429	18,751,384	21,071,000	22,815,329	30,463,008	35,369,449	36,573,559	43,439,980
Aircraft	4,059,427	3,348,111	3,497,407	6,314,583	13,030,092	25,329,498	30,001,167	34,986,618	35,519,312	28,196,529
Amunition	2,216,272	2,214,625	2,653,459	2,603,170	2,749,259	2,952,773	3,612,622	3,718,455	4,128,094	4,666,032
3. Others	25,426,287	28,914,099	32,693,402	36,170,624	39,033,417	42,587,984	43,909,630	49,491,948	62,043,894	67,990,764
4. TOTAL	68,061,990	75,044,167	84,995,834	97,269,607	114,407,344	139,281,191	162,220,095	187,863,451	214,452,927	238,992,567

FISCAL YEAR	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
1. Personnel & Provisions	122,846,066	149,937,055	163,262,653	179,762,677	185,334,281	191,297,957	203,530,509	219,986,573	221,455,053	241,612,693
Personnel	117,101,727	143,507,653	156,835,786	172,738,026	178,487,242	183,657,108	195,220,126	211,933,374	213,610,019	233,337,365
Provisions	5,744,339	6,429,402	6,426,867	7,024,651	6,847,039	7,640,849	8,310,383	8,053,199	7,845,034	8,275,328
2. Front-Line	67,798,003	79,282,791	94,825,664	122,036,601	129,885,952	159,706,698	184,520,099	205,031,650	224,606,414	280,595,496
Ship	30,505,971	45,435,678	54,778,854	80,355,593	90,752,394	116,159,631	129,848,344	129,010,634	145,533,804	167,256,728
Aircraft	32,013,465	27,302,695	32,247,862	34,760,293	29,969,429	33,770,764	44,384,208	61,917,254	63,562,177	94,498,117
Amunition	5,278,567	6,544,418	7,798,948	6,920,715	9,164,129	9,776,303	10,287,547	14,103,762	15,510,433	18,840,651
3. Others	77,403,452	84,831,154	99,067,873	119,309,580	138,783,614	158,652,455	165,112,304	177,884,036	207,975,650	183,775,385
4. TOTAL	268,047,521	314,051,000	357,156,190	421,108,858	454,003,847	509,657,110	553,162,912	602,902,259	654,037,117	705,983,574

FISCAL YEAR	1985	1986	1987	1988	1989	1990	1991	1992
1. Personnel & Provisions	258,862,767	282,669,925	301,194,097	310,677,258	311,969,791	317,413,953	331,612,132	352,070,892
Personnel	250,243,013	273,905,603	292,209,296	301,411,255	302,651,459	307,889,707	323,319,513	344,950,847
Provisions	8,619,754	8,764,322	8,984,801	9,266,003	9,318,332	9,524,246	8,292,619	7,120,045
2. Front-Line	278,395,331	313,741,813	338,066,676	383,589,887	365,232,202	317,391,989	424,201,821	367,768,428
Ship	167,226,780	173,761,134	171,185,059	197,900,806	186,803,025	140,526,832	190,080,170	166,575,259
Aircraft	89,744,488	113,136,954	136,201,730	154,620,946	142,162,227	133,067,936	181,779,526	155,759,020
Amunition	21,424,063	26,843,725	30,679,887	31,068,135	36266950	43797221	52342125	45434149
3. Others	196,008,477	196,874,686	222,287,431	246,481,678	294,357,843	341,216,641	329,569,251	380,315,090
4. TOTAL	733,266,575	793,286,424	861,548,204	940,748,823	971,559,836	976,022,583	1,085,383,204	1,100,154,410

Source: Kaijojieitai Yosan Jimuteiyo (Kaijobakuryokanbu)

APPENDIX K

JMSDF SHIPBUILDING COST (DE, DD, DDG, SS)

Fiscal Year	Type	Ship Name	Ton (Standard)	Total Real Value FY1985 Base (Unit: 1000Yen)	Total Nominal Value (Unit: 1000Yen)	Nominal Value 1956	1957	1958	1959	1960	1961	1962
1956	SS	OYASHIO	1,100	12,144,905	2,718,000	456,000	1,182,520	729,430	160,503	189,547		
1957	DD	HARUSAME	1,800	8,308,898	1,934,721		365,910	601,451	967,360			
1957	DD	TAKANAMI	1,700	8,308,898	1,934,721		365,910	601,451	967,360			
1958	DD	OONAMI	1,700	8,488,423	2,045,774			638,415	499,616	907,743		
1958	DD	MAKINAMI	1,700	8,488,423	2,045,774			638,415	499,616	907,743		
1959	DE	ISUZU	1,490	7,043,042	1,767,481				418,985	1,022,090	326,406	
1959	DE	MOGAMI	1,490	7,043,042	1,767,481				418,985	1,022,090	326,406	
1959	SS	HAYASHIO	750	6,606,476	1,678,869				351,773	761,349	327,449	238,298
1959	SS	WAKASHIO	750	6,606,476	1,678,869				351,773	761,349	327,449	238,298

						1960	1961	1962	1963	1964	1965	1966
1960	DDG	AMATSUKAZE	3,050	14,215,567	4,013,287	265,379	929,878	650,900	1,387,050	780,080		
1960	SS	NATSUSHIO	790	6,674,718	1,796,909	302,100	1,052,190	168,522	274,097			
1960	SS	FUYUSHIO	790	6,674,718	1,796,909	302,100	1,052,190	168,522	274,097			
1961	DE	OOI	1,490	7,420,057	2,039,298		346,183	1,172,818	520,297			
1961	DE	KITAKAMI	1,490	7,420,057	2,039,298		346,183	1,172,818	520,297			
1961	SS	OOSHIO	1,600	12,058,401	3,511,731		419,500	434,457	1,447,988	1,209,786		
1962	DD	YAMAGUMO	2,050	10,110,612	3,055,662			336,710	809,379	1,462,843	446,730	
1963	DD	MAKIGUMO	2,050	10,953,853	3,445,847				541,299	1,461,068	1,443,480	
1963	DD	TAKATSUKI	3,100	14,242,918	4,615,877				857,024	838,447	1,380,099	1,540,307
1963	SS	ASASHIO	1,650	12,367,682	3,971,804				766,536	763,582	1,646,111	795,575

						1964	1965	1966	1967	1968	1969	1970
1964	DD	ASAGUMO	2,050	10,154,748	3,472,577	525,060	920,302	1,251,314	775,901			
1964	DD	KIKUZUKI	3,050	17,934,419	6,176,966	706,338	1,867,289	1,675,105	1,928,234			
1964	SS	HARUSHIO	1,650	11,620,773	3,971,804	646,540	887,198	1,666,107	771,959			
1965	DD	MINEGUMO	2,100	11,023,913	3,946,441		801,542	977,786	1,383,432	783,681		
1965	DD	MOTIZUKI	3,100	18,380,248	6,660,128		1,083,570	1,069,663	2,534,628	1,972,267		
1965	SS	MITISHIO	1,650	11,003,653	3,936,853		917,172	769,462	1,465,790	784,429		
1966	DD	NATSUGUMO	2,100	10,955,084	4,157,155			669,413	517,731	2,073,557	896,454	
1966	DD	NAGATSUKI	3,100	19,283,320	7,296,452			1,225,127	896,243	3,835,421	1,339,661	
1966	SS	ARASHIO	1,650	11,038,516	4,170,149			926,507	913,029	1,242,689	1,087,924	
1966	TV	KATORI	3,350	8,959,309	3,421,518			149,400	637,574	1,991,965	642,579	
1967	DD	MURAKUMO	2,150	11,051,293	4,456,114				735,962	468,456	2,356,636	895,060
1967	DE	TIKUGO	1,470	7,955,372	3,206,833				547,985	288,446	1,786,799	583,603
1967	SS	UZUSHIO	1,850	15,479,852	6,175,385				1,407,771	1,041,882	2,369,272	1,356,460

Source: Kaijojieitai Yosan Jimuteiyo (Kaijobakuryokanbu)

APPENDIX K (cont'd)

Fiscal Year	Type	Ship Name	Ton (Standard)	Total Real Value FY1985 Base (Unit: 1000Yen)	Total Nominal Value (Unit: 1000Yen)	Nominal Value						
						1968	1969	1970	1971	1972	1973	1974
1968	DDH	HARUNA	4,700	20,532,027	9,109,710	732,553	1,727,605	897,605	4,241,007	1,510,940		
1968	DE	AYASE	1,480	7,510,484	3,226,378	266,579	313,859	1,921,342	724,598			
1968	DE	MIKUMA	1,470	7,510,484	3,226,378	266,579	313,859	1,921,342	724,598			
1968	SS	MAKISHIO	1,850	14,194,970	6,064,207	718,713	1,236,951	2,340,968	1,767,575			
1969	DD	AOKUMO	2,150	11,206,156	5,143,336		450,751	504,262	2,903,622	1,284,701		
1969	DE	TOKATI	1,470	7,968,508	3,650,927		313,957	380,217	2,136,368	820,385		
1969	SS	ISOSHIO	1,850	14,740,710	6,713,264		708,911	1,438,083	2,617,352	1,948,918		
1970	DDH	HIEI	4,700	20,746,106	10,981,532			228,053	1,798,761	4,541,999	1,534,455	2,878,264
1970	DE	IWASE	1,470	9,055,679	4,235,974			346,826	2,344,690	1,544,458		
1970	DE	CHITOSE	1,480	8,570,139	4,249,145			346,826	475,990	2,392,618	1,033,711	
1970	SS	NARUSHIO	1,850	14,571,088	7,188,735			798,284	1,532,003	2,776,818	2,081,630	

						1971	1972	1973	1974	1975	1976	1977
1971	DDG	TACHIKAZE	3,850	31,198,660	18,488,161	665,045	4,274,562	3,756,677	6,298,103	3,493,774		
1971	DD	ASAGUMO	2,150	11,025,293	6,229,048	556,537	639,850	3,404,700	1,627,961			
1971	DE	NIYODO	1,470	8,565,993	4,372,623	338,766	2,454,818	1,579,039				
1971	SS	KUROSHIO	1,850	13,774,589	7,565,595	797,643	2,367,046	2,187,619	2,213,287			
1972	DE	TESHIO	1,500	8,053,066	4,723,877		420,851	2,632,401	1,670,625			
1972	DE	YOSHINO	1,500	8,053,066	4,723,877		420,851	2,632,401	1,670,625			
1972	DE	KUMANO	1,500	7,318,108	4,717,693		420,851	482,644	2,678,840	1,135,358		
1972	SS	TAKASHIO	1,850	13,949,194	8,554,981		971,734	2,920,053	2,185,889	2,477,305		

						1973	1974	1975	1976	1977	1978	1979
1973	DDG	ASAKAZE	3,850	40,308,987	30,136,794	1,952,953	4,633,867	4,312,261	4,781,559	9,173,913	5,282,241	
1973	DE	NOSHIRO	1,500	10,954,913	8,131,297	466,991	583,083	1,065,161	3,980,016	2,036,046		
1973	SS	YAESHIO	1,850	20,705,002	15,232,172	964,898	701,612	4,793,300	4,353,327	4,419,035		
1974	DD	YUGUMO	2,150	17,157,833	12,987,931		1,490,478	1,804,465	5,233,676	4,459,312		
1975	DDH	SHIRANE	5,200	47,666,371	39,100,797			369,250	10,368,230	4,444,308	14,933,687	8,985,322
1975	SS	YUSHIO	2,200	28,987,971	23,714,656			256,064	5,355,230	6,474,904	4,809,338	6,819,120

						1976	1977	1978	1979	1980	1981	1982
1976	DDH	KURAMA	5,200	48,869,649	42,018,826	981,653	8,669,666	3,703,481	15,945,356	12,718,670		
1977	DD	HATSUYUKI	2,950	32,894,496	29,306,275		290,492	7,339,468	3,850,824	13,121,976	4,703,515	
1977	DE	ISHIKARI	1,290	14,068,471	12,234,004		63,138	3,146,710	5,820,292	3,203,864		
1977	SS	MOCHISHIO	2,200	29,315,454	25,576,992		390,362	12,578,885	2,820,062	9,787,683		
1978	DDG	SAWAKAZE	3,950	46,479,217	42,379,973			1,069,455	10,219,757	8,989,744	17,371,400	4,729,617
1978	DD	SHIRAYUKI	2,950	30,735,065	28,143,950			570,492	6,413,630	4,291,371	11,977,391	4,891,066
1978	SS	SETOSHIO	2,200	29,175,424	26,319,941			297,361	9,162,075	6,709,320	10,151,185	

APPENDIX K (cont'd)

Fiscal Year	Type	Ship Name	Ton (Standard)	Total Real Value FY1985 Base (Unit: 1000Yen)	Total Nominal Value (Unit: 1000Yen)	Nominal Value						
						1979	1980	1981	1982	1983	1984	1985
1979	DD	MINEYUKI	2,950	32,921,674	30,901,596	825,214	7,590,097	5,178,194	12,405,573	4,902,518		
1979	DD	SAWAYUKI	2,950	32,921,674	30,901,596	825,214	7,590,097	5,178,194	12,405,573	4,902,518		
1979	DD	HAMAYUKI	2,950	32,921,674	30,901,596	825,214	7,590,097	5,178,194	12,405,573	4,902,518		
1979	DE	YUBARI	1,470	16,396,047	15,208,907	534,403	5,418,135	6,885,705	2,370,664			
1979	SS	OKISHIO	2,200	27,925,058	25,877,989	275,415	12,468,179	6,950,569	6,183,826			
1980	DD	ISOYUKI	2,950	33,277,788	31,960,088		887,625	7,878,073	5,521,568	12,384,745	5,288,077	
1980	DD	HARUYUKI	2,950	33,277,788	31,960,088		887,625	7,878,073	5,521,568	12,384,745	5,288,077	
1980	DE	YUBETSU	1,470	17,497,082	16,592,106		691,606	5,878,868	6,974,888	3,046,744		
1980	SS	NADASHIO	2,250	31,173,098	29,551,456		834,303	14,189,081	8,483,377	6,044,695		
1981	DDG	HATAKAZE	4,600	62,670,571	61,197,355			4,959,618	9,607,821	13,243,892	23,895,175	9,490,849
1981	DD	YAMAYUKI	3,050	34,437,168	33,780,951			587,100	5,272,095	5,871,515	15,807,428	6,242,813
1981	DD	MATSUYUKI	3,050	34,437,168	33,780,951			587,100	5,272,095	5,871,515	15,807,428	6,242,813
1981	SS	HAMASHIO	2,250	31,724,905	30,768,117			463,729	8,712,209	12,030,065	9,562,114	

						1982	1983	1984	1985	1986	1987	1988
1982	DD	SETOYUKI	3,050	38,022,103	37,882,943	703,675	6,190,439	5,050,870	18,780,033	7,157,926		
1982	DD	ASAYUKI	3,050	38,022,103	37,882,943	703,675	6,190,439	5,050,870	18,780,033	7,157,926		
1982	DD	SHIMAYUKI	3,050	38,022,103	37,882,943	703,675	6,190,439	5,050,870	18,780,033	7,157,926		
1982	SS	AKISHIO	2,250	32,545,862	32,151,497	353,186	8,348,492	11,639,945	11,809,874			
1983	DDG	SHIMAKAZE	4,650	64,964,160	65,635,208		1,241,279	10,582,831	12,177,983	29,209,115	12,424,000	
1983	DD	ASAGIRI	3,500	40,359,168	40,885,838		71,836	5,361,632	5,716,837	21,087,196	8,648,337	
1983	SS	TAKESHIO	2,250	29,200,966	29,380,163		48,672	7,228,888	9,162,809	12,939,794		
1984	DD	YAMAGIRI	3,500	37,258,776	37,933,090			72,971	3,432,504	6,645,920	19,926,520	7,855,175
1984	DD	YUGIRI	3,500	37,258,776	37,933,090			72,971	3,432,504	6,645,920	19,926,520	7,855,175
1984	DD	AMAGIRI	3,500	37,258,776	37,933,090			72,971	3,432,504	6,645,920	19,926,520	7,855,175
1984	SS	YUKISHIO	2,250	29,739,792	30,194,849			41,048	6,924,745	9,925,145	13,303,911	

						1985	1986	1987	1988	1989	1990	1991
1985	DD	HAMAGIRI	3,550	38,995,939	40,049,732	60,113	3,181,249	7,298,736	19,881,958	9,627,676		
1985	DD	SETOGIRI	3,550	38,995,939	40,049,732	60,113	3,181,249	7,298,736	19,881,958	9,627,676		
1985	DD	SAWAGIRI	3,550	38,995,939	40,049,732	60,113	3,181,249	7,298,736	19,881,958	9,627,676		
1985	SS	SACHISHIO	2,250	30,696,036	31,308,311	82,301	7,606,108	10,766,115	12,853,787			
1986	DD	UMIGIRI	3,550	38,674,024	40,477,713		37,669	2,601,550	7,217,054	22,067,985	8,553,455	
1986	DE	ABUKUMA	2,000	23,609,808	24,341,835		240,222	3,756,590	11,250,941	9,094,082		
1986	DE	JINTSUU	2,000	23,609,808	24,341,835		240,222	3,756,590	11,250,941	9,094,082		
1986	SS	HAMASHIO	2,450	37,402,606	38,997,795		148,808	2,836,863	12,623,798	13,535,700	9,852,626	
1987	DE	OOYODO	2,000	22,750,956	23,968,376			193,460	2,851,470	11,859,001	9,064,445	
1987	DE	SENDAI	2,000	22,750,956	23,968,376			193,460	2,851,470	11,859,001	9,064,445	
1987	SS	NATSUSHIO	2,450	35,477,370	37,226,224			166,930	10,604,993	10,842,613	15,611,688	

APPENDIX K (cont'd)

Fiscal Year	Type	Ship Name	Ton (Standard)	Total Real Value FY1985 Base (Unit: 1000Yen)	Total Nominal Value (Unit: 1000Yen)	Nominal Value 1988	1989	1990	1991	1992	1993	1994
1988	DDG	KONGO	7,200	113,380,204	122,274,218	3,328,159	20,250,031	23,901,616	59,791,769	15,002,643		
1988	SS		2,400	35,339,722	37,947,987	121,564	7,862,881	14,146,926	15,816,616			
1989	DE		1,900	22,966,502	25,058,244		156,837	2,974,134	12,431,758	9,495,515		
1989	DE		1,900	22,966,502	25,058,244		156,837	2,974,134	12,431,758	9,495,515		
1989	SS		2,450	35,819,834	39,058,357		135,865	7,573,920	13,585,479	17,763,093		
1990	DDG		7,200	116,951,534	129,212,919			3,403,861	21,101,827	25,337,932	63,521,492	15,847,807
1990	SS		2,450	35,975,840	39,630,120			97,167	10,864,256	11,009,393	17,659,304	

						1991	1992	1993	1994	1995
1991	DDG		7,200	109,987,409	122,672,009	3,021,453	19,518,092	23,744,641	60,786,954	15,600,869
1991	DD		4,400	54,485,316	60,930,352	513,490	5,789,018	9,559,024	32,378,636	12,690,184

APPENDIX L

JMSDF SHIPBUILDING COST (EXCEPT DE, DD, DDG, SS)

Fiscal Year	Type	SHIP NAME	TON (Standard)	Total Real Value FY1985 (Unit: 1000Yen)	Total Nominal Value (Unit: 1000Yen)	Nominal Value 1964	1965	1966	1967	1968
1964	PT	HIYODORI	480	2,043,892	657,816	258,358	399,458			
1964	MSC	RISHIRI	340	1,807,224	583,734	196,073	387,661			
1964	MSC	RE8UN	340	1,807,224	583,734	196,073	387,661			
1965	MSC	AMAMI	340	1,862,471	601,262	206,977	394,285			
1965	MSC	URUME	340	1,862,471	601,262	206,977	394,285			
1965	MSC	MINASE	340	1,853,726	598,527	204,640	393,887			
1965	ASH	NO-6	45	465,136	149,645	59,674	89,971			
1966	MSC	I8UKI	340	1,759,709	603,466		205,133	398,333		
1966	MSC	KATSURA	340	1,759,709	603,466		205,133	398,333		
1967	MSC	TAKAMI	380	2,653,048	985,287			190,547	241,932	552,808
1967	MSC	IOU	380	2,622,346	973,937			187,737	239,123	547,077
1967	ASR	FUSHIMI	1,500	3,461,235	1,277,333			322,060	382,254	573,019
1967	AT5	AZUMA	2,000	4,617,798	1,723,536			271,338	294,880	1,157,318
1967	ACS	AKASI	1,500	2,848,478	1,050,855			355,370	40,933	654,552
						1967	1968	1969	1970	1971
1968	MSC	MIYAKE	380	2,457,949	968,407	188,689	240,074	539,644		
1968	MSC	UTONE	380	2,457,949	968,407	188,689	240,074	539,644		
1969	MSC	AWAJI	380	2,671,607	1,087,283		102,296	984,987		
1969	MSC	TOSHI	380	2,671,607	1,087,283		102,296	984,987		
1969	M5T	HAYA5E	2,000	5,941,508	2,445,097		263,028	1,540,423	641,646	
1969	MMC	5OYA	2,000	7,520,426	3,096,749		301,666	1,995,496	799,587	
1969	PT	NO-11	100	2,178,830	869,902		296,633	573,269		
1970	MSC	TEURI	380	2,885,496	1,235,505			107,792	1,127,713	
1970	MSC	MUROT5U	380	2,885,496	1,235,505			107,792	1,127,713	
1970	PT	NO-12	100	2,225,673	946,898			207,898	739,000	
1970	LST	ATSUMI	1,450	4,228,878	1,879,905			245,100	508,671	1,126,134
1970	YAS	NO-103	500	859,306	363,770			117,501	246,269	
						1970	1971	1972	1973	1974
1971	MSC	TASHIRO	380	2,888,638	1,349,630	114,362	764,290	470,978		
1971	MSC	MIYATO	380	2,888,638	1,349,630	114,362	764,290	470,978		
1971	MS8	NO-7	50	725,956	329,191	68,064	261,127			
1971	MS8	NO-8	50	695,870	316,166	56,389	259,777			
1971	PT	NO-13	100	2,359,584	1,062,864	323,139	739,725			
1971	YA5	NO-104	500	850,330	383,077	115,739	267,338			

Source : Kaijojeitai Yosan Jimutelyo (Kaijobakuryokanbu)

APPENDIX L (cont'd)

Fiscal Year	Type	SHIP NAME	TON (Standard)	Total Real Value FY1985 (Unit: 1000Yen)	Total Nominal Value (Unit: 1000Yen)	Nominal Value 1970	1971	1972	1973	1974
1972	MSC	TAKANE	380	3,009,952	1,535,168		138,039	842,775	554,354	
1972	MSC	MUTSUKI	380	3,009,952	1,535,168		138,039	842,775	554,354	
1972	MS8	NO-9	50	659,493	319,969		48,803	271,166		
1972	MS8	NO-10	50	659,493	319,969		48,803	271,166		
1972	PT	NO-14	100	2,391,148	1,146,896		379,752	767,144		
1972	LST	MIURA	2,000	6,164,231	3,268,492		309,713	813,038	2,145,741	
1972	LST	MOTOBU	1,500	3,809,858	1,844,583		341,127	1,503,456		
1972	YA5	NO-105	500	1,047,274	503,599		146,666	356,933		
1973	MSC	YOKOTE	380	2,739,152	1,563,956			153,223	1,094,495	316,238
1973	MSC	SAKATE	380	2,739,152	1,563,956			153,223	1,094,495	316,238
1973	MS8	NO-11	50	649,105	355,547			55,662	299,885	
1973	MS8	NO-12	50	649,105	355,547			55,662	299,885	
1973	PT	NO-15	100	2,377,828	1,272,181			415,818	856,363	

						1972	1973	1974	1975	1976
1973	LST	OJIKA	2,000	4,991,647	3,086,048	269,055	812,097	2,004,896		
1974	MSC	OOMI	380	2,952,064	1,961,828		203,088	1,335,624	423,116	
1974	MSC	FUKUE	380	2,952,064	1,961,828		203,088	1,335,624	423,116	
1974	LST	SATSUMA	2,000	5,349,459	3,617,310		292,747	1,715,060	1,609,503	
1975	MSC	OKITSU	380	4,112,737	2,949,349			279,991	1,969,834	699,524
1975	MSC	HASHIRA	380	4,112,737	2,949,349			279,991	1,969,834	699,524
1975	MSC	IWAI	380	3,970,692	2,943,417			279,991	521,110	2,142,316
1975	LST	NEMURO	1,500	4,630,682	3,324,901			459,280	1,884,670	980,951

						1975	1976	1977	1978	1979
1976	MSC	HATSUSHIMA	440	5,378,024	4,239,887	226,062	1,283,983	2,729,842		
1976	AGS	FUTAMI	2,000	9,401,465	7,463,893	433,781	1,371,008	5,659,104		
1976	AOE	SAGAMI	5,000	15,316,700	12,144,972	578,213	2,737,768	8,828,991		
1977	MSC	NINOSHIMA	440	5,234,636	4,359,857		251,631	1,210,655	2,897,571	
1977	MSC	MIYASHIRO	440	5,047,900	4,208,844		193,389	1,194,138	2,821,317	
1977	ARC	MUROTO	4,500	16,949,896	13,934,436		1,839,820	5,165,812	6,928,804	
1978	MSC	ENOSHIMA	440	4,627,083	3,961,415			69,766	1,153,471	2,738,178
1978	MSC	UKISHIMA	440	4,443,615	3,805,172			52,323	1,114,081	2,638,768

APPENDIX L (cont'd)

Fiscal Year	Type	SHIP NAME	TON (Standard)	Total Real Value FY1985 (Unit: 1000Yen)	Total Nominal Value (Unit: 1000Yen)	Nominal Value				
						1978	1979	1980	1981	1982
1979	MSC	OOSHIMA	440	4,583,425	4,075,190	90,268	1,536,907	2,448,015		
1979	MSC	NIIJIMA	440	4,582,843	4,074,675	90,268	1,536,652	2,447,755		
1979	LSU	YURA	500	2,227,294	1,913,014	208,982	1,704,032			
1979	LSU	NOTO	500	2,042,009	1,753,762	201,098	1,552,664			
1979	AGS	SUMA	1,100	5,523,701	4,887,654	600,546	1,660,188	2,626,920		
1980	MSC	YAKUSHIMA	440	4,586,628	4,251,760		99,446	1,529,382	2,622,932	
1980	MSC	NARUSHIMA	440	4,586,024	4,251,202		99,446	1,529,106	2,622,650	
1981	MSC	CHICHIJIMA	440	4,831,576	4,575,304			6,611	1,353,803	3,214,890
1981	MSC	TORISHIMA	440	4,831,576	4,575,304			6,611	1,353,803	3,214,890
						1980	1981	1982	1983	1984
1981	AS	CHIYODA	3,600	18,792,756	17,938,795	58,202	2,906,783	9,194,621	5,779,189	
1982	MSC	HAHAJIMA	440	4,723,656	4,554,980		7,356	1,269,745	3,277,879	
1982	MSC	TAKASHIMA	440	4,723,656	4,554,980		7,356	1,269,745	3,277,879	
1983	MSC	NUWAJIMA	440	4,610,432	4,543,109			7,621	1,013,527	3,521,961
1983			440	4,610,432	4,543,109			7,621	1,013,527	3,521,961
1983	MSC	ETAJIMA	440	4,610,432	4,543,109			7,621	1,013,527	3,521,961
1983	AGS	WAKASA	2,000	9,044,673	8,898,548			212,008	2,267,456	6,419,084
						1983	1984	1985	1986	1987
1984	MSC	KAMISHIMA	440	4,441,814	4,431,920	7,753	955,756	3,468,411		
1984	MSC	HIMESHIMA	440	4,441,814	4,431,920	7,753	955,756	3,468,411		
1984	AOE	TOWADA	8,300	18,901,620	18,853,902	58,379	4,545,379	14,250,144		
1985	MSC	OGISHIMA	440	4,755,414	4,827,602		11,505	1,128,591	3,687,506	
1985	MSC	MOROSHIMA	440	4,755,414	4,827,602		11,505	1,128,591	3,687,506	
1986	MSC	YURISHIMA	440	4,739,064	4,833,674			8,560	1,128,115	3,696,999
1986	MSC	HIKOSHIMA	440	4,736,569	4,831,129			8,560	1,125,579	3,696,990
1986	LCU	NO-1	420	1,698,975	1,732,787			8,371	1,724,416	
						1985	1986	1987	1988	1989
1986	STS	KUROBE	2,200	14,300,585	14,585,813	39,188	1,755,481	12,791,144		
1987	MSC	AWASHIMA	490	5,070,284	5,171,690		8,841	1,116,332	4,046,517	
1987	MSC	SAKUSHIMA	490	5,070,284	5,171,690		8,841	1,116,332	4,046,517	
1987	AOE	TOKIWA	8,300	19,575,901	19,967,419		52,197	4,160,888	15,754,334	
1987	AOE	HAMANA	8,300	18,909,806	19,288,002		34,762	4,083,580	15,169,660	
1988	MSC	UWASHIMA	490	6,338,990	6,619,263			11,659	1,235,354	5,372,250
1988	MSC	IESHIMA	490	6,329,516	6,609,372			11,659	1,233,409	5,364,304

APPENDIX L (cont'd)

Fiscal Year	Type	SHIP NAME	TON (Standard)	Total Real Value FY1985 (Unit: 1000Yen)	Total Nominal Value (Unit: 1000Yen)	Nominal Value 1988	1989	1990	1991	1992
1989	MSO		1,000	15,168,060	16,295,726	192,055	2,549,857	6,802,057	6,751,757	
1989	MSO		1,000	15,069,636	16,189,344	190,987	2,540,699	6,776,492	6,681,166	
1989	AOS	HIBIKI	2,800	13,590,775	14,285,962	169,323	13,013,038	1,103,601		
1990	MSO		1,000	15,996,747	17,428,480		223,096	3,013,900	7,937,021	6,254,463
1990	MSC		490	6,484,507	7,042,999		10,909	1,321,350	5,710,740	
1990	PG		50	9,012,726	9,755,883		27,516	3,581,290	6,147,077	
1990	PG		50	6,300,451	6,826,907		7,320	2,156,337	4,663,250	
1990	LCU		420	1,810,816	1,937,405		8,828	1,928,577		
1990	AOS		2,800	13,451,779	14,412,639		165,624	13,026,773	1,220,242	
1991	MSC		490	7,046,032	7,736,274			13,053	1,525,495	6,197,726

APPENDIX M

JMSDF SHIPBUILDING COST (by Type)

TYPE / FY	SHIP NAME	REAL COST (FY1985) (1000 Yen)	Cost/Ton (FY1985) (1000 Yen)	Cost/Ton/GNP
DE				
FY1961	KITAKAMI	7,420,057	4,980	6.88E-08
1967	CHIKUGO	7,955,372	5,412	4.72E-08
1977	ISHIKARI	14,068,471	10,906	4.99E-08
1979	YUBARI	16,396,047	11,154	4.59E-08
1986	ABUKUMA	23,609,808	11,805	3.58E-08
DD				
FY1962	YAMAGUMO	10,110,612	4,932	6.87E-08
1963	TAKATSUKI	14,242,918	4,594	5.82E-08
1977	HATSUYUKI	32,894,496	11,151	5.23E-08
1983	ASAGIRI	40,359,168	11,531	4.08E-08
DDG				
FY1960	AMATSUKAZE	14,215,567	4,661	7.90E-08
1971	TACHIKAZE	31,198,660	8,104	5.80E-08
1981	HATAKAZE	62,670,571	13,624	5.11E-08
1988	GONGO	113,380,204	15,747	4.48E-08
SS				
FY1960	HAYASHIO	6,674,718	8,449	1.37E-07
1963	OSHIO	12,367,682	7,496	9.40E-08
1967	UZUSHIO	15,479,852	8,367	7.23E-08
1975	YUSHIO	28,987,971	13,176	7.08E-08
1986	HAMASHIO	31,724,905	14,100	5.25E-08

Source: Kaijojleitai Yosan Jimuteiyo (Kaijobakuryokanbu)

APPENDIX N

JMSDF AIRCRAFT INVENTORIES

Fixed Wing

FY	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
P2V-7		6	6	10	16	19	29	42	56	56	59	60	59	59	58	55	50	43	37	30	26
P-2J													1	1	1	3	14	25	36	47	55
S2F-1				16	48	60	60	60	59	58	58	58	56	56	56	51	37	23	25	24	25
PV-2	16	16	16	14	11	8	5														
P8Y-6A		2	2	2	2	1															
T8M	10	14	20	16	15	7	7														
PS-1															2	2	2	4	9	14	15
OTERS	13	17	29	81	93	91	90	88	100	89	85	68	62	60	60	75	82	84	84	90	90
TOTAL	39	55	73	139	185	186	191	190	215	203	202	186	178	176	177	186	185	179	191	205	211

FY	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
P2V-7	20	15	12	9	4	2	1									
P-2J	62	70	76	80	80	80	79	78	78	76	61	48	39	28	18	10
P-3C							3	8	13	18	25	32	40	50	59	67
S2F-1	24	24	24	25	22	17	13	10								
PS-1	15	17	17	18	19	19	19	17	15	13	9	5	3			
OTERS	93	90	86	85	83	87	85	91	87	87	81	79	79	80	82	85
TOTAL	214	216	215	217	208	205	200	204	193	194	176	164	161	158	159	162

Helicopter

FY	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
H55-2(A)										1	4	11	14	17	19	25	31	38	43	49	55
H5S-1					1	4	7	7	5	5	5	5	5	5	4	3	3	1			
HSS-1N								5	9	9	9	9	9	9	9	8	8	8	5	2	
S-51	3	3	3	3	3	3	3														
OTHERS	6	8	10	10	10	10	18	17	18	19	20	23	22	20	22	27	23	23	27	27	28
TOTAL	9	11	13	13	14	17	28	29	32	34	38	48	50	51	54	63	65	70	75	78	83

FY	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
HSS-2(A)	58	61	59	57	58	56	55	50	46	38	28	22	14	9	5	2
HSS-28					4	8	16	17	23	30	34	42	51	62	79	76
5H-60J															2	2
OTHERS	30	30	32	31	33	33	34	32	32	32	29	29	27	28	28	31
TOTAL	88	91	91	88	95	97	105	99	101	100	91	93	92	99	114	111

Source: Kantei To Kokukisyu (Kajojieishinbunsya)

APPENDIX O

JMSDF AIRCRAFT PROCUREMENT COST

Fiscal Year	Aircraft	Amount	Total Real Value FY1985 (Unit:1000Yen)	Total Nominal Value (Unit:1000Yen)	Nominal Value 1958	1959	1960	1961	1962	1963	1964	1965	1966
1958	P2V-7	42	56,924,512	14,801,798	178,944	2,168,602	3,320,303	4,905,903	4,228,046				
1958	H55-1	2	1,233,375	291,174	111,228	179,946							
1958	S-55A	6	2,215,750	526,062	131,516	394,546							
1959	H55-1	4	2,343,200	576,656		219,456	357,200						
1959	S-55A	2	798,474	196,346		78,538	117,808						
1960	HSS-1N	6	3,746,741	996,492			189,102	807,390					
1961	8-65	3	713,678	192,693				52,695	139,998				
1961	KM-2	10	1,215,600	328,212				15,382	312,830				
1961	HSS-1N	3	1,973,100	532,737				158,538	374,199				
1961	V-107	2	1,890,133	510,336					510,336				
1961	S-55A	2	770,733	208,098				71,818	136,280				
1962	P2V-7	6	13,140,922	4,074,917					88,526	937,486	1,745,397	1,303,508	
1962	8-65	3	673,954	192,693					37,173	155,520			
1962	KM-2	15	1,529,663	460,225					52,351	171,002	144,827	92,045	
1962	HS5-2	11	12,263,173	3,804,889					137,046	842,692	1,476,686	1,348,465	
1963	8-65	3	728,358	222,693						44,919	177,774		
1963	S-62	2	1,199,999	363,810						118,752	245,058		
1964	8-65	3	770,677	252,693							25,269	227,424	
1964	HS5-2	4	4,280,883	1,455,936							39,461	615,144	801,331
1965	YS-11M	1	1,999,183	688,214								189,750	498,464
1965	8-65	6	1,396,010	485,508								51,077	434,431

					1965	1966	1967	1968	1969	1970	1971	1972	1973
1965	H55-2	4	5,177,824	1,845,580	176,880	853,561	815,139						
1965	8ELL-47	2	167,073	55,134	55,134								
1966	YS-11M-A	1	1,950,616	710,885		189,750	521,135						
1966	8-65	1	220,012	80,918		8,513	72,405						
1966	HS5-2	4	5,495,216	2,050,688		256,786	572,900	1,221,002					
1966	S-62	1	539,526	196,010		63,259	132,751						
1967	P-2J	13	45,369,394	18,777,525			651,592	2,722,584	5,482,032	9,921,317			
1967	YS-11T-A	1	2,884,795	1,150,147			178,393	168,888	802,866				
1967	H5S-2	6	7,872,680	3,137,033			388,557	617,623	2,130,853				
1967	S-62	2	1,120,336	422,046			136,226	285,820					
1967	8ELL-47G-2A	1	76,511	28,309			28,309						
1968	PS-1	2	9,165,725	4,013,640				349,781	349,782	1,236,950	2,077,127		
1968	YS-11T-A	2	5,758,575	2,402,996				209,600	935,048	1,258,348			
1968	8-65	2	517,172	209,712				29,492	180,220				
1968	KM-2	3	286,268	115,258				26,751	88,507				
1968	H5S-2	7	8,813,960	3,689,980				478,703	759,228	2,452,049			
1968	S-62	3	1,599,193	639,537				204,339	435,198				

Source : Kaijojeitai Yosan Jimutelyo (Kaijobakuryokanbu)

APPENDIX 0 (cont'd)

Fiscal Year	Aircraft	Amount	Total Real Value FY1985 (Unit:1000Yen)	Total Nominal Value (Unit:1000Yen)	Nominal Value 1969	1970	1971	1972	1973	1974	1975	1976	1977
1969	P-2J	11	36,293,809	16,185,976	1,035,733	5,487,766	9,662,477						
1969	YS-11T-A	1	2,661,208	1,175,436	104,800	515,126	555,510						
1969	8-65	2	502,719	214,680	30,525	184,155							
1969	H55-2	7	8,615,864	3,828,360	505,902	1,049,804	2,272,654						
1969	S-62	1	539,016	228,208	73,166	155,042							
1969	BELL-47G-2A	50	283,493	116,232	116,232								
1970	P-2J	11	35,087,004	16,671,138		1,045,268	5,759,852	9,866,018					
1970	PS-1	5	27,758,136	13,167,445		946,900	4,629,380	7,591,165					
1970	YS-11M-A	1	1,729,357	778,059		250,049	528,010						
1970	H55-2	6	7,197,542	3,406,008		438,566	913,750	2,053,692					
1970	V-107	2	2,881,457	1,300,668		355,496	945,172						
1970	BELL-47G-2A	1	75,958	32,662		32,662							
1971	P-2J	11	32,537,476	17,194,534			1,066,440	5,562,325	10,565,769				
1971	PS-1	5	26,471,542	13,913,514			997,236	4,856,314	8,059,964				
1971	H55-2	6	7,263,291	3,852,056			303,454	1,045,929	2,502,673				
1,971	V-107	2	2,881,485	1,393,008			290,105	1,102,903					
1972	P-2J	8	21,920,585	13,473,696				849,926	4,586,289	8,037,481			
1972	PS-1	1	5,032,022	3,098,154				210,335	997,997	1,889,822			
1972	US-1	1	4,944,595	3,050,130				236,918	894,561	1,918,651			
1972	YS-11M-A	1	1,561,339	837,216				259,937	577,279				
1972	TC-90	3	1,225,570	666,756				136,941	529,815				
1972	YS-11T-A	2	4,871,374	2,643,474				591,468	2,052,006				
1972	H55-2	6	7,810,891	4,791,426				295,057	1,697,731	2,798,638			
1972	V-107	1	1,330,366	723,765				148,680	575,085				
1972	OH-6	2	365,327	179,010				179,010					
1973	P-2J	8	22,011,248	15,066,391					955,225	5,120,997	8,990,169		
1973	PS-1	1	5,163,073	3,536,161					244,880	1,072,467	2,218,814		
1973	US-1	2	9,217,867	6,302,930					486,301	1,867,569	3,949,060		
1973	KM-2	3	343,308	221,697					42,354	179,343			
1973	TC-90	1	413,526	266,472					53,914	212,558			
1973	H55-2	6	8,059,025	5,512,475					343,627	1,966,282	3,202,566		
1973	V-107	1	1,284,274	827,042					170,147	656,895			
1973	S-61A	1	1,218,048	834,571					60,056	237,119	537,396		
1973	OH-6J	1	160,029	89,616					89,616				
1974	P-2J	8	21,795,664	16,044,784						1,026,327	5,425,193	9,593,264	
1974	P5-1	2	9,942,678	7,324,432						503,875	2,333,324	4,487,233	
1974		3	355,486	249,483						48,779	200,704		
1974	KM-2	3	355,486	249,483						48,779	200,704		
1974	TC-90	1	409,057	288,341						35,002	253,339		
1974	H55-2	6	7,991,347	5,888,820						373,281	1,909,349	3,606,190	
1974	V-107	1	1,292,635	906,448						189,662	716,786		
1974	S-61A	1	1,160,375	860,534						61,781	185,343	613,410	

APPENDIX 0 (cont'd)

Fiscal Year	Aircraft	Amount	Total Real Value FY1985 (Unit:1000Yen)	Total Nominal Value (Unit:1000Yen)	Nominal Value 1975	1976	1977	1978	1979	1980	1981	1982	1983
1975	P-2J	6	20,729,602	16,277,838	1,041,696	5,569,616	9,666,526						
1975	PS-1	2	11,794,423	9,364,496	635,216	1,512,694	7,216,586						
1975	KM-2	4	581,903	435,936	89,605	346,331							
1975	H55-2	4	6,349,440	4,992,208	324,905	1,597,175	3,070,128						
1976	P-2J	6	19,788,955	16,534,284		691,077	4,140,910	11,702,297					
1976	PS-1	2	11,713,333	9,794,298		416,238	2,283,056	7,095,004					
1976	KM-2	8	1,180,669	948,128		124,856	823,272						
1976	H55-2	6	10,276,618	8,589,950		320,329	2,171,651	6,097,970					
1976	S-61A	1	1,608,161	1,343,390		56,331	341,745	945,314					
1977	PS-1	1	6,197,174	5,300,179			221,485	1,336,077	3,742,617				
1977	US-1	1	6,305,290	5,388,612			253,046	1,557,000	3,578,566				
1977	KM-2	5	791,829	670,845			44,738	626,107					
1977	TC-90	1	478,080	403,932			49,333	354,599					
1977	H5S-2A	4	8,776,854	7,502,168			270,029	2,486,902	4,745,237				
1977	S-61A	1	1,783,776	1,525,317			63,308	409,906	1,052,103				
1978	P-3C	8	65,330,310	59,895,262				1,254,607	13,044,036	13,060,820	7,685,096	24,850,703	
1978	US-1	2	12,056,085	10,772,869				507,390	2,792,458	7,473,021			
1978	KM-2	5	837,262	719,473				48,635	670,838				
1978	TC-90	1	469,515	403,232				46,822	356,410				
1978	HSS-2A	4	9,675,731	8,649,084				284,881	2,334,423	6,029,780			
1979	US-1	1	6,137,966	5,695,667					271,871	1,478,167	3,945,629		
1979	KM-2	3	433,349	392,803					26,568	366,235			
1979	TC-90	2	774,484	700,674					70,638	630,036			
1979	H5S-28	8	21,979,244	20,394,073					685,716	6,146,401	13,561,956		
1979	S-61A	2	3,612,646	3,354,928					139,234	849,552	2,366,142		

					1980	1981	1982	1983	1984	1985	1986	1987	1988
1980	P-3C	10	99,635,352	96,123,030	1,396,077	11,774,999	24,802,698	35,045,234	23,104,022				
1980	US-1	1	6,211,311	5,872,080	283,424	1,523,511	4,065,145						
1980	TC-90	2	841,270	788,136	80,612	707,524							
1980	HSS-2B	2	5,560,360	5,262,694	177,816	1,112,157	3,972,721						
1981	KM-2	1	172,120	163,396		11,074	152,322						
1981	TC-90	4	1,829,212	1,735,768		186,463	1,549,305						
1981	H55-2B	6	16,971,852	16,368,965		365,344	3,898,390	12,105,231					
1981	S-61A	1	1,871,115	1,806,086		51,741	344,123	1,410,222					
1982	P-3C	7	81,179,792	80,547,418			916,394	6,532,934	37,827,203	35,270,887			
1982	KM-2	2	326,933	316,628			23,585	293,043					
1982	TC-90	3	1,595,600	1,544,031			175,775	1,368,256					
1982	H5S-2B	8	21,696,555	21,332,508			484,493	6,144,086	14,703,929				
1982	S-61A	4	7,084,450	6,968,848			190,773	1,781,165	4,996,910				
1982	OH-6D	2	425,277	411,984			25,412	386,572					

APPENDIX O (cont'd)

Fiscal Year	Aircraft	Amount	Total Real Value FY1985 (Unit:1000Yen)	Total Nominal Value (Unit:1000Yen)	Nominal Value 1983	1984	1985	1986	1987	1988	1989	1990	1991
1983	P-3C	7	78,161,103	79,001,965	705,119	3,554,857	28,914,524	45,827,465					
1983	US-1A	1	5,104,405	5,086,035	119,992	1,451,260	3,514,783						
1983	TC-90	2	1,186,537	1,171,672	145,506	1,026,166							
1983	H55-28	5	13,088,272	13,046,284	229,711	3,453,427	9,363,146						
1983	OH-6D	1	260,801	258,193		258,193							
1983	SH-60B	1	4,464,523	4,446,448	139,920	1,361,059	2,945,469						
1984	P-3C	8	88,610,107	90,338,480		293,270	1,747,120	34,325,521	53,972,569				
1984	US-1A	1	5,199,249	5,298,617		42,100	167,057	5,089,460					
1984	TC-90	1	602,406	601,640		75,800	525,840						
1984	U-36A	1	3,735,075	3,771,009		56,407	1,852,920	1,861,682					
1984	H55-28	7	15,269,675	15,519,973		107,591	2,591,755	12,820,627					
1984	S-61A	1	1,852,564	1,888,037		14,427	57,038	1,816,572					
1984	OH-6D	2	461,732	461,732			461,732						
1984	SH-60B	1	3,867,367	3,920,558		141,842	992,898	2,785,818					
1985	P-3C	10	112,567,757	114,819,112				2,663,674	52,030,368	60,125,070			
1985	U-36A	1	3,918,357	3,995,466			62,918	1,662,588	2,269,960				
1985	H55-28	10	22,288,226	22,731,031			147,967	3,790,049	18,793,015				
1985	S-61A	1	1,873,175	1,910,349			14,499	57,315	1,838,535				
1986	P-3C	10	103,862,628	107,531,280					2,510,653	49,321,644	55,698,983		
1986	US-1A	1	5,523,479	5,633,949				44,624	177,105	5,412,220			
1986	TC-90	1	585,912	597,630				74,829	522,801				
1986	KM-2	1	353,125	360,188				22,827	94,717	242,644			
1986	H55-28	13	28,315,019	28,881,319				184,530	4,282,227	24,414,562			
1986	MH-53E	4	19,484,030	20,023,040				153,108	1,608,934	13,034,460	5,226,538		
1987	P-3C	9	84,353,525	89,398,710						1,938,901	40,137,158	47,322,651	
1987	U-36A	1	2,720,724	2,817,494					47,899	1,287,151	1,482,444		
1987	LC-90	1	523,946	534,425					59,579	474,846			
1987	KM-2	2	688,413	702,181					43,032	659,149			
1987	EP-3	1	11,727,578	12,430,376						118,374	5,897,319	6,414,683	
1987	H55-28	17	36,111,414	37,748,584					230,049	5,495,566	32,022,969		
1987	OH-6D	2	455,542	464,653						464,653			
1987	MH-53E	2	8,709,357	9,174,199					69,520	692,539	5,641,507	2,770,633	
1988	P-3C	9	81,741,148	88,262,253						0	1,858,021	40,917,696	45,486,536
1988	US-1A	1	5,614,311	6,001,481						46,794	185,742	5,768,945	
1988	U-36A	1	2,627,122	2,787,912						41,656	1,105,999	1,640,257	
1988	KM-2	3	981,768	1,028,901						66,470	962,431		
1988	EP-3	1	10,550,401	11,392,879						0	113,356	5,496,596	5,782,927
1988	SH-60J	12	52,124,538	56,405,532						277,233	1,383,130	18,109,655	36,635,514

APPENDIX 0 (cont'd)

Fiscal Year	Aircraft	Amount	Total Real Value FY1985 (Unit:1000Yen)	Total Nominal Value (Unit:1000Yen)	Nominal Value 1989	1990	1991	1992	1993	1994
1989	P-3C	10	88,412,210	96,776,936	0	2,056,056	45,654,531	49,066,349		
1989	U-36A	1	2,361,682	2,552,255	40,610	1,093,069	1,418,576			
1989	LC-90	2	898,862	959,845	101,695	858,150				
1989	KM-2	2	693,093	740,722	46,620	694,102				
1989	OH-6D	2	388,757	415,970	0	415,970				
1989	MH-53E	4	16,226,389	17,704,022	135,719	1,351,771	10,970,141	5,246,391		
1989	SH-60J	12	52,443,026	57,466,176	272,822	1,384,666	18,457,909	37,350,779		
1989	UH-60J	3	8,674,900	9,441,162	0	774,640	8,666,522			
1990	P-3C	8	76,827,167	84,880,608		0	1,771,611	40,154,434	42,954,563	
1990	LC-90	2	991,116	1,078,040		121,804	956,236			
1990	T-5	7	2,664,563	2,900,947		183,306	2,717,641			
1990	SH-60J	11	49,952,544	55,251,647		264,069	1,417,649	17,577,197	35,992,732	
1991	P-3C	2	18,296,122	20,423,792			0	359,338	6,807,724	13,256,730
1991	US-1A	1	6,350,332	7,046,016			52,129	208,515	6,785,372	
1991	T-5	9	3,579,192	3,934,737			258,798	3,675,939		
1991	NP-3	1	7,631,391	8,513,173			0	104,010	3,562,375	4,846,788
1991	SH-60J	5	23,055,027	25,725,830			130,065	718,444	8,786,535	16,090,786
1991	UH-60J	3	11,107,004	12,320,176			0	945,813	11,374,363	
1991	MH-53E	1	5,214,284	5,794,117			46,199	461,992	4,019,332	1,266,594

APPENDIX P

JMSDF SHIPBUILDING COST (by DEFENSE PROGRAM)

DEFENSE PROGRAM	TERM (Fiscal Year)	Tons/Year	Real Value/Year (10^3 Yen)	Nominal Value/Year (10^3 Yen)	Nominal GNP/Year (10^8Yen)	Cost/GNP/Year
3rd DBP	1967-1971	10,982	6.03E+07	2.83E+07	6.48E+05	4.36E-04
4th DBP	1972-1976	9,812	6.90E+07	5.13E+07	1.35E+06	3.80E-04
Post 4th DBP	1977-1979	12,433	7.62E+07	6.89E+07	1.25E+06	5.52E-04
MTDPE	1980-1982	13,403	9.44E+07	9.20E+07	1.56E+06	5.91E-04
MTDPE	1983-1985	16,330	9.59E+07	9.73E+07	1.83E+06	5.31E-04
MTDP	1986-1990	14,724	1.54E+08	1.65E+08	3.83E+06	4.30E-04

Source: Kaijojieitai Yosan Jimutetyo (Kaijobakuryokanbu)

APPENDIX Q

JAPAN'S GNP DATA

Fiscal Year	Nominal GNP (Unit:10^8 Yen)	Real GNP (Unit:10^8 Yen)
1955	86,278	437,487
1960	166,620	667,688
1961	199,000 *	735,610 *
1962	217,000 *	792,252 *
1963	256,000 *	872,270 *
1964	297,000 *	958,625 *
1965	336,730	1,027,023
1966	395,000 *	1,138,294 *
1967	462,000 *	1,262,368 *
1968	547,926	1,428,570
1969	648,907	1,601,010
1970	751,520	1,730,287
1971	828,063	1,819,459
1972	965,391	1,983,252
1973	1,166,792	2,077,445
1974	1,381,558	2,072,992
1975	1,522,094	2,156,318
1976	1,711,525	2,243,215
1977	1,900,348	2,350,044
1978	2,087,809	2,470,612
1979	2,254,018	2,606,053
1980	2,453,600	2,688,179
1981	2,603,343	2,773,674
1982	2,734,615	2,871,843
1983	2,859,973	2,957,881
1984	3,057,253	3,090,860
1985	3,253,705	3,239,592
1986	3,396,853	3,333,099
1987	3,562,636	3,497,698
1988	3,792,300	3,706,417
1989	4,058,039	3,874,782
1990	4,352,543	4,071,364
1991	4,585,991	4,208,448

Source: Enonomic Planning Agency (Except *)
* : Zusetsu Nihon no Zaisei (Toyokeizaishinposya)

APPENDIX R

JMSDF SHIP INVENTORIES DATA

	RUSSIA		U.S.		US(PACIFIC)		FRANCE	
	QTY	DISPLACEMENT (FULL TON)	QTY	DISPLACEMENT (FULL TON)	QTY	DISPLACEMENT (FULL TON)	QTY	DISPLACEMENT (FULL TON)
SSBN	59	731,150	25	332,250	8	150,000	5	44,600
SSGN	38	286,200					5	13,350
SSG	12	46,200						
SSN	62	393,839	83	504,613	28	166,945		
SS	77	225,844					8	11,192
CARRIER	5	229,500	12	1,057,784	6	526,863	2	65,560
CRUISER	29	313,650	49	457,044	28	262,660	1	13,270
DESTROYER	38	266,450	40	319,126	18	144,573	15	75,006
FRIGATE	150	278,720	56	224,917	25	99,824	26	46,500
MINE WAREFARE FORCE	263	103,522	8	10,496	3	3,936	21	12,265
AMPHIBIOUS FORCE	76	233,810	60	1,019,719	30	517,427	9	40,650
TOTAL	809	3,108,884	333	3,925,949	146	1,872,228	92	322,393

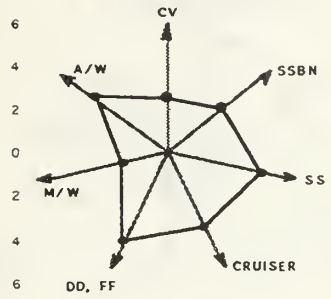
	U.K.		JAPAN		U.S Ships Homeported in Japan	
	QTY	DISPLACEMENT (FULL TON)	QTY	DISPLACEMENT (FULL TON)	QTY	DISPLACEMENT (FULL TON)
SSBN	4	34,000				
SSGN						
SSG						
SSN	13	65,756				
SS	6	14,595	14	35,180		
CARRIER	2	39,000			1	80,643
CRUISER					2	18,932
DESTROYER	12	51,900	39	162,660	3	24,120
FRIGATE	30	125,124	18	35,405	3	12,300
MINE WAREFARE FORCE	31	22,302	37	7,442		
AMPHIBIOUS FORCE	6	43,401	6	13,220	5	99,015
TOTAL	104	396,078	114	253,907	14	

SOURCE: JANE'S FIGHTING SHIP 1992-93

APPENDIX S
FLEET COMPOSITION
(Number of Ships in Natural Log.)

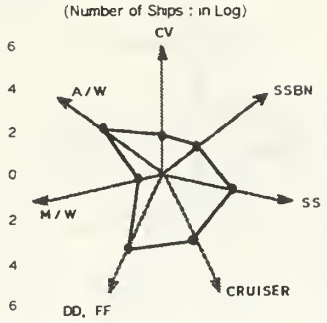
U.S

(Number of Ships : in Log)



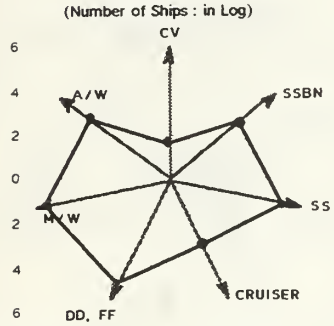
U.S Pacific

(Number of Ships : in Log)



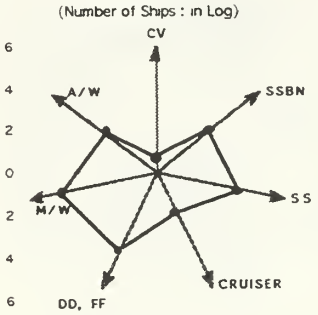
RUSSIA

(Number of Ships : in Log)



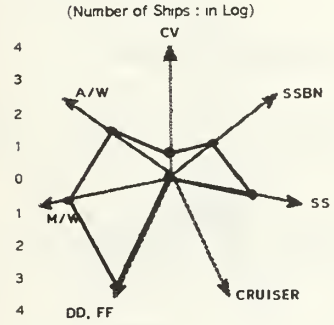
RUSSIA Pacific

(Number of Ships : in Log)



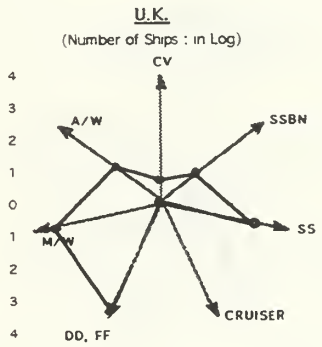
FRANCE

(Number of Ships : in Log)



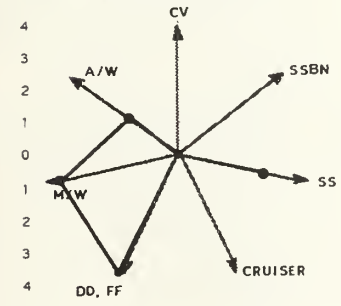
U.K.

(Number of Ships : in Log)

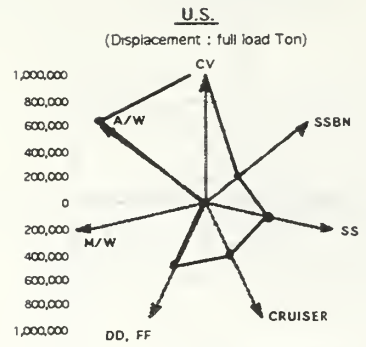


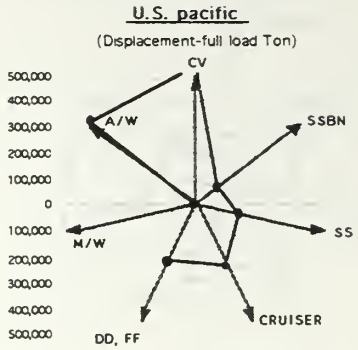
JAPAN

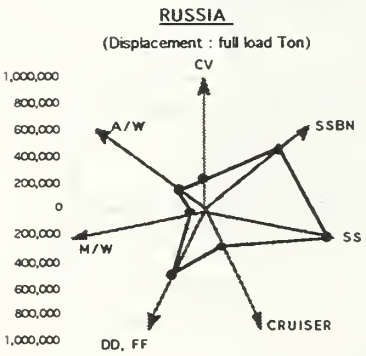
(Number of Ships : in Log)

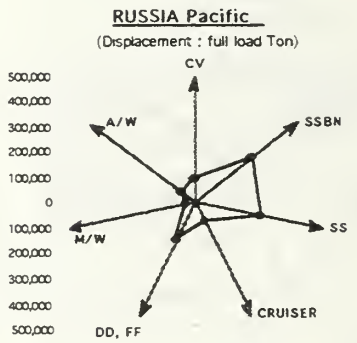


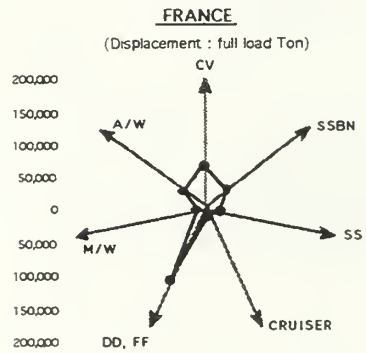
APPENDIX T
FLEET COMPOSITION (Full Load Ton)

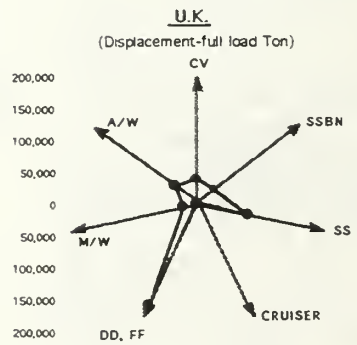


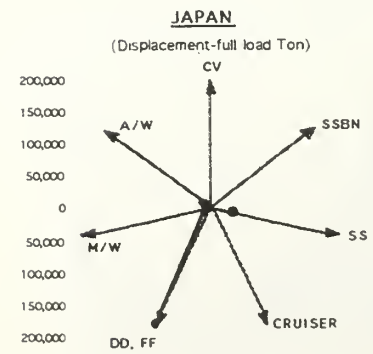






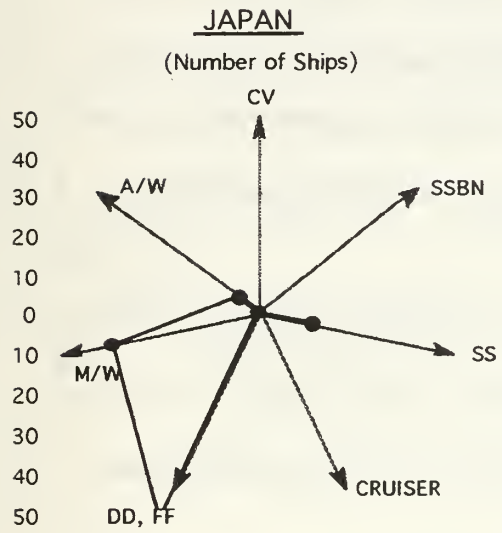


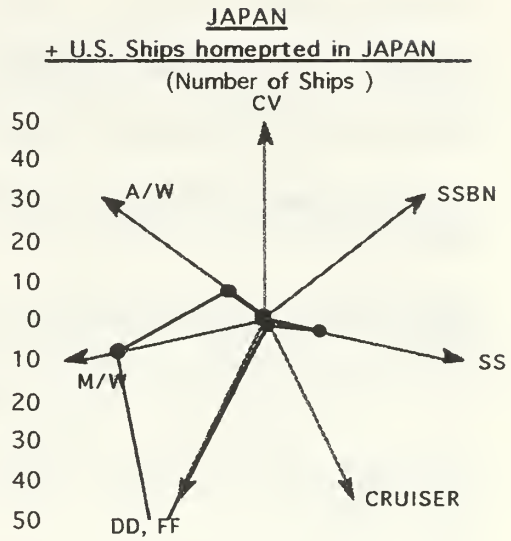


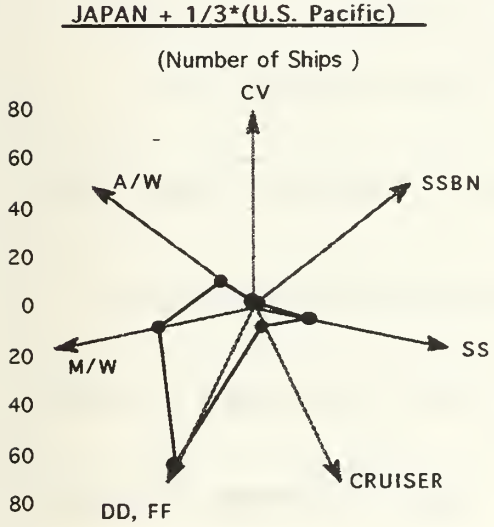


APPENDIX U

Fleet Combination Between Japan and U.S. (Number of Ships)







LIST OF REFERENCES

1. Defense Agency, *Defense of Japan 1991,* Defense Agency, Tokyo, 1991.
2. Defense Agency, *Defense of Japan 1982,* Defense Agency, Tokyo, 1982.
3. Defense Agency, *Defense of Japan 1978,* Defense Agency, Tokyo, 1978.
4. Defense Agency, *Summary Defense of Japan 1988,* Defense Agency, Tokyo, 1988.
5. Kaijobakuryokanbu, *Kaijojieitai Yosan Jimuteiyo,* Kaijojieitai, Tokyo, 1992.
6. *Kantei To Kokukishu,* Kaijojiei Shinbunsha, Tokyo, 1991.
7. Yamaguchi, Kosei, *Zusetsu Nihon No Zaisei,* Toyokeizai Shinposha, Tokyo, 1992.
8. *Boei Handbook,* Asagumo Shinbunsha, Tokyo, 1992.
9. Yoshimasa, Muroyama, *Nichibeianpotaisei,* Yuhikaku, Tokyo, 1992.
10. Research Institute for Peace and Security, *Asian Security 1992-93,* BRASSEY'S, London, 1992.
11. International Institute for Strategic Studies, *The Military Balance 1992-1993,* BRASSEY'S, London, 1992.
12. Jane's Information Group, *Jane's Fighting Ship 1992-93,* Butler and Tanner Ltd., London, 1992.
13. Jane's Information Group, *Jane's All the World Aircraft 1992-93,* Butler and Tanner Ltd., London, 1992.
14. Harrison, M, Holland, *Managing Defense : Japan's Dilemma,* University Press of America, 1988.
15. U.S. Arms Control and Disarmament Agency, *World Military Expenditures and Arms Transfers 1990,* U.S. Government Printing Office, Washington, DC, 1991.
16. White House, *National Security Strategy of the United States,* U.S. Government Printing Office, Washington, DC, August 1991.

17. U.S. Joint Chiefs of Staff, *The National Military Strategy of the United States,* U.S. Government Printing Office, Washington, DC, January 1992.

18. U.S. Department of the Navy, *...From the Sea,* U.S. Government Printing Office, Washington, DC, September 1992.

19. U.S. Joint Chiefs of Staff, *Chairman of the Joint Chiefs of Staff Report on the Roles, Missions, and Functions of the Arms Forces of the United States,* U.S. Government Printing Office, Washington, DC, February 1993.

20. U.S. Department of the Defense, *Report on Allied Contributions to the Common Defense,* U.S. Government Printing Office, Washington, DC, April 1990.

21. U.S. Department of Defense, *A Strategic Framework for the Asian Pacific RIM : Looking toward the 21st Century,* U.S. Government Printing Office, Washington, DC, 1990.

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